

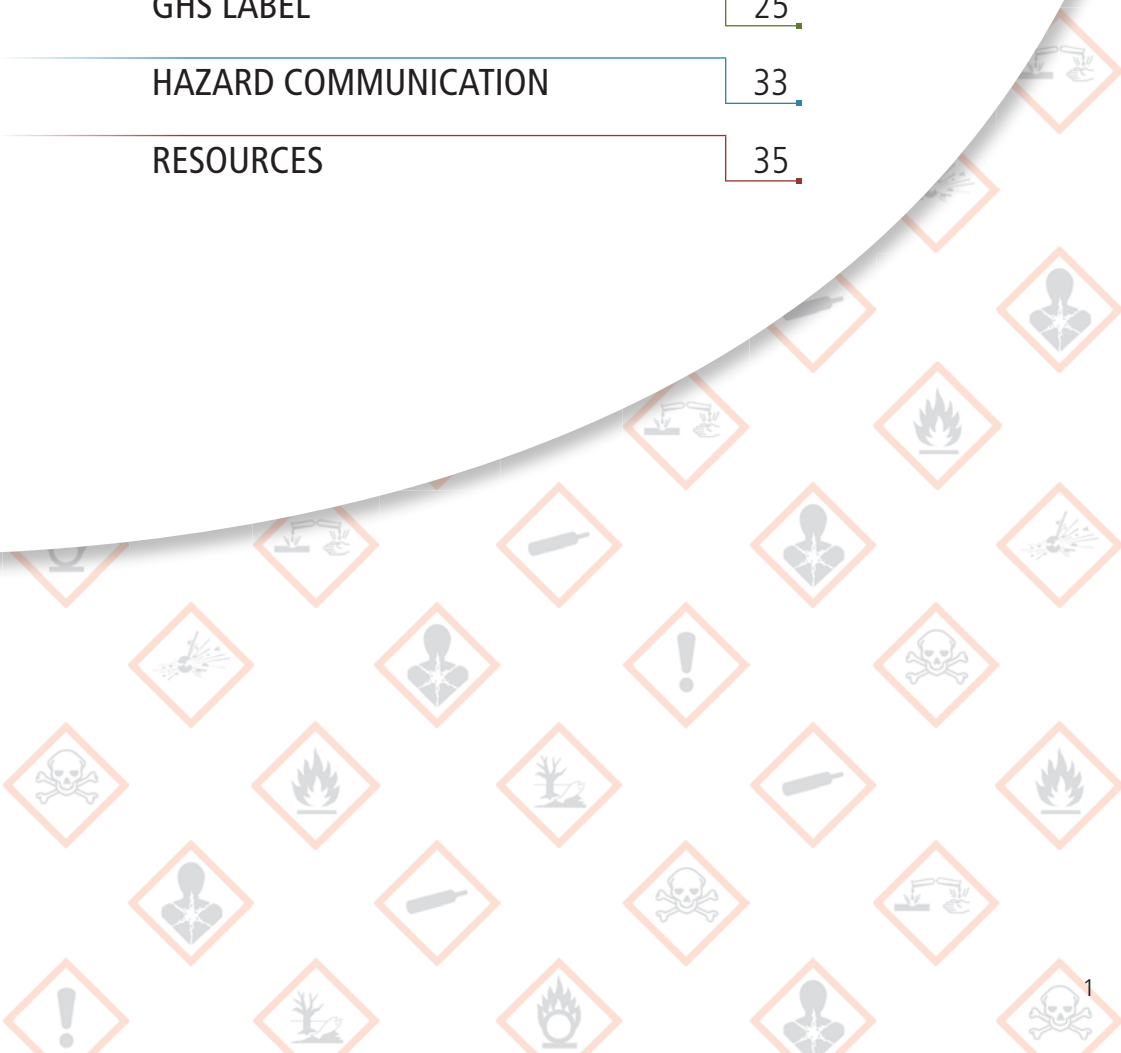
Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Singapore



Contents

OVERVIEW	3
GHS CLASSIFICATION	7
SAFETY DATA SHEET	17
GHS LABEL	25
HAZARD COMMUNICATION	33
RESOURCES	35



OVERVIEW

OVERVIEW

What is the GHS?

GHS is the abbreviation for Globally Harmonised System of Classification and Labelling of Chemicals. It was developed by the United Nations for chemical hazard communication through standardised:

- Chemical hazard classification
- Chemical product labelling
- Safety data sheets (SDS)

What is the purpose of the GHS?

The purpose of the GHS is to:

- Enhance the protection of humans and the environment against hazardous chemicals
- Facilitate international trading of chemicals

What are your roles in GHS implementation?

Chemical manufacturers and suppliers must classify and label their products, prepare the SDS, and provide information on the products to their customers or users.

Employers and workplace occupiers must obtain the SDS, label the containers and inform their employees about the hazards involved and the precautions to take.

What is GHS Hazard Classification?

Chemicals are classified into different classes or categories based on their:

- Physical properties
- Health effects or toxicity
- Environmental toxicity

The classified chemicals are assigned a fixed set of GHS pictograms.

Physical Hazards



- Oxidiser



- Flammables and others



- Explosives and others



- Gas under pressure



- Corrosive to metals

Health Hazards



- Acute toxicity



- Target organ toxicity and others



- Corrosive to skin and serious eye damage



- Irritant and others

Environmental Hazards



- Environmental toxicity



- Hazardous to the ozone layer

Why is GHS hazard communication important in chemical management?

Hazard communication through labelling, SDS and training is an integral part of chemical management. The GHS hazard communication is the starting point that provides the necessary information for the establishment of a chemical safety programme, which forms part of the safety and health management system.

What is the timeline for GHS Implementation?

Manufacturers/Suppliers	Timeline
Single Substances	
Hazard classes and categories under SS 586:2008 (based on GHS purple book Rev 2)	Feb 2012
New hazard classes and categories under SS 586:2014, i.e. Ozone depleting substances, chemically unstable gases, aerosols, sensitisers (based on GHS purple book Rev 4)	1 Jul 2015
Mixtures	1 Jul 2015
Users	Timeline
Single Substances	
Hazard classes and categories under SS 586:2008 (based on GHS purple book Rev 2)	End 2012
New hazard classes and categories under SS 586:2014, i.e. Ozone depleting substances, chemically unstable gases, aerosols, sensitisers (based on GHS purple book Rev 4)	1 Jul 2015
Mixtures	1 Jul 2016

GHS CLASSIFICATION

GHS CLASSIFICATION

The Globally Harmonised System of Classification and Labelling of Chemicals (GHS) is a chemical hazard communication system between chemical suppliers and chemical users through labelling of containers and provision of safety data sheets (SDS).

GHS classifies chemicals based on their inherent properties or hazards in accordance with certain classification criteria. A fixed set of GHS pictograms, signal words, hazard and precautionary statements is assigned to the classified chemicals for labelling and SDS preparation.

Information provided on the labels and SDS enables users of hazardous chemicals to identify the hazards associated with the chemicals, and to take the necessary precautions to ensure the safe use of the chemicals.

HAZARD CLASSIFICATION

GHS classifies chemicals or mixtures into three main classes viz Physical Hazards, Health Hazards and Environmental Hazards.

Each hazard class is divided into different sub-classes based on the intrinsic hazardous properties of the chemicals. Each hazard sub-class is further classified into different hazard categories depending on the varying degrees or severity of the hazard.

Every hazard category is known as a “building block” in GHS. A lower category number indicates a more hazardous nature of the chemical or mixture and vice versa.

Physical Hazards

There are 16 hazard classes under the Physical Hazards as summarized in Table 1.

Table 1. Physical Hazard Classes

Hazard Class	Hazard Category							
Explosive	Unstable Explosives	Div 1.1	Div 1.2	Div 1.3	Div 1.4	Div 1.5	Div 1.6	
Flammable gases (including chemically unstable gases)	Flammable Gas Cat 1	Flammable Gas Cat 2	Chemically unstable Gas Cat A	Chemically unstable Gas Cat B				
Aerosols	Cat 1	Cat 2	Cat 3					
Oxidizing gases	Cat 1							
Gases under pressure	Compressed Gas	Liquefied Gas	Refrigerated Liquefied Gas	Dissolved Gas				
Flammable liquids	Cat 1	Cat 2	Cat 3	Cat 4*				
Flammable solids	Cat 1	Cat 2						
Self-reactive substances and mixtures	Type A	Type B	Type C & D	Type E & F	Type G			
Pyrophoric liquids	Cat 1							
Pyrophoric solids	Cat 1							
Self-heating substances and mixtures	Cat 1	Cat 2						
Substances and mixtures which, in contact with water, emit flammable gases	Cat 1	Cat 2						Cat 3
Oxidizing liquids	Cat 1	Cat 2						Cat 3
Oxidizing solids	Cat 1	Cat 2						Cat 3
Organic peroxides	Type A	Type B						Type C & D
Corrosive to metals	Cat 1							

Note: Flammable liquid Category 4 is not adopted in Singapore except diesel

Health Hazards

There are 10 hazard classes under the Health Hazards as shown in Table 2.

Table 2. Health Hazard Classes

Hazard Class	Hazard Category				
Acute toxicity	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Skin corrosion/irritation	Cat 1A	Cat 1B	Cat 1C	Cat 2	Cat 3
Serious eye damage/eye irritation	Cat 1	Cat 2A	Cat 2B		
Respiratory or skin sensitisation	Respiratory Cat 1A	Respiratory Cat 1B	Skin Cat 1A	Skin Cat 1B	
Germ cell mutagenicity	Cat 1A	Cat 1B	Cat 2		
Carcinogenicity	Cat 1A	Cat 1B	Cat 2		
Reproductive toxicity	Cat 1A	Cat 1B	Cat 2	Lactation	
Specific target organ toxicity - single exposure	Cat 1	Cat 2	Cat 3		
Specific target organ toxicity - repeated exposure	Cat 1	Cat 2			
Aspiration hazard	Cat 1	Cat 2			

Note: The categories in purple (Acute toxicity Category 5, Skin corrosion/irritation Category 3, Aspiration hazard Category 2) are not adopted in Singapore.

When data is not sufficient for classification into sub-categories for the following hazard classes:

- Skin corrosion/irritation Categories 1A, 1B and 1C can be combined into Category 1.
- Serious eye damage/eye irritation Categories 2A and 2B can be combined into Category 2.
- Respiratory/skin sensitisation Categories 1A and 1B can be combined into Category 1.

Environmental Hazards

There are three hazard classes under the Environmental Hazards as indicated in Table 3.

Table 3. Environmental Hazard Classes

Hazard Class	Hazard Category			
Hazardous to the Aquatic Environment				
- Acute toxicity	Cat 1	Cat 2	Cat 3	
- Chronic toxicity	Cat 1	Cat 2	Cat 3	Cat 4
Hazardous to the Ozone Layer	Cat 1			

Note: Acute toxicity Categories 2 and 3, and Chronic Toxicity Categories 3 and 4 are not adopted in Singapore.

DATA FOR CLASSIFICATION

The data used for hazard classification may be obtained from standard literature, field experience and laboratory tests e.g. flash point and boiling point are used for classification of flammable liquids, flammable range for flammable gases, and lethal dose (LD_{50}) for acute toxicity.

Test data that is already generated for chemical classification can be used when classifying chemicals.

SINGLE SUBSTANCE VS MIXTURE

A single substance is a chemical element or its compound in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.

A mixture means a solution composed of two or more substances in which they do not react.

CLASSIFICATION OF MIXTURES

If a reaction occurs during the manufacture of mixtures, and a new product results, the substance must undergo hazard classification based on GHS criteria to determine the hazard of the resultant product.

For physical hazards classification, the GHS physical hazard criteria apply to mixtures which should be tested for the physical hazard parameters.

For health and environmental hazards classification, the GHS approach to the classification of mixtures is dependent upon the amount of information available for the mixture itself and its components. The process for the classification of mixtures is based on the following:

1. Where test data is available for the mixture itself, the classification of the mixture will always be based on that data (refer to GHS Purple Book for exception for carcinogens, mutagens and reproductive toxins).
2. When test data is not available for the mixture itself, but there is sufficient data, on similar tested mixtures or individual hazardous ingredients within the mixture, such data can be used in accordance with the following bridging principles.

- a. **Dilution:** If a mixture is diluted with a substance which has an equivalent or lower hazard category classification than the least hazardous original ingredient substance, the new mixture may be classified as equivalent to the original mixture.
- b. **Batching:** The hazard category of one production batch of a complex mixture can be assumed to be substantially equivalent to that of another production batch of the same commercial product, produced by or under the control of the same supplier.
- c. **Concentration of highly hazardous mixtures:** If a mixture is classified in the highest hazard category, and the concentrations of the ingredients of the mixture that are in that category are increased, the new mixture shall be classified in that category without additional testing.
- d. **Interpolation within one toxicity category:** Given three mixtures A, B and C with identical hazardous ingredients: If mixtures A and B are in the same hazard category and mixture C has the same active hazardous ingredients with concentrations intermediate to the concentrations of those hazardous ingredients in mixtures A and B, then mixture C is assumed to be in the same hazard category as A and B.
- e. **Substantially similar mixtures:** Given the following:
 - (a) Two mixtures each containing two ingredients:
 - (i) A + B
 - (ii) C + B;
 - (b) The concentration of ingredient B is essentially the same in both mixtures;
 - (c) The concentration of ingredient A in mixture (i) equals that of ingredient C in mixture (ii);
 - (d) Hazard data for A and C is available and substantially equivalent, i.e. they are in the same hazard category and are not expected to affect the classification of B.

If mixture (i) is already classified in a particular hazard class based on test data, mixture (ii) shall be assigned the same hazard category.

- f. **Aerosols:** An aerosol form of mixture shall be classified in the same hazard category as the tested non-aerosolised form of the mixture, provided that the added propellant does not affect the hazardous properties of the mixture upon spraying. Classification of aerosolized mixtures for inhalation toxicity should be considered separately.

3. Classification of mixtures based on ingredients of the mixture

- **Physical Hazard**

As a principle, it will be classified in accordance with the same criteria as those used for substances, using test data available for the complete mixture.

- **Health Hazard**

Acute toxicity: Classification of mixtures based on available **Acute Toxicity Estimate (ATE) values** for all relevant ingredients for ingredients of the mixture and using the ***additivity formula***: Concentration and ATE value of component.

Other hazard classes: Classification of mixtures based on **cut-off values** for all relevant ingredients for ingredients of the mixture.

- **Environmental Hazard**

Classification of mixtures when data is available for all ingredients or only for some ingredients of the mixture is done via:

- (1) ***Additivity formula***: Concentration and LC_{50} or EC_{50} of ingredients, or
- (2) ***Summation of classified ingredients***: Concentration of ingredients and Multiplying factor (**M**) for highly toxic ingredients.

For detailed information on the classification process such as formula and methods, please refer to the UN GHS document or the Guidebook on GHS Classification and Labelling of Chemicals for further guidance.

When to classify the chemicals?

When concentration of chemicals meets the cut-off value of hazard classes, they will require classification. The following tables summarize the cut-off values for respective hazard classes.

Table 4. Generic cut-off concentration for some hazard classes

Hazard Class	Generic cut-off value to be taken into account
Acute toxicity	
Category 1-3	0.1%
Category 4	1%
Skin Corrosion/Irritation	1% (NOTE)
Serious eye damage/eye irritation	1% (NOTE)
Hazardous to aquatic environment	
Acute/Chronic Category 1	1% (NOTE)

NOTE: Or <1% where relevant, based on available data that the presence of the ingredient at a lower concentration is still relevant for classification.

Table 5. Concentration cut-off for classification of mixtures containing respiratory and skin sensitisers

Ingredient classification	Generic concentration limits triggering classification of a mixture as		
	Respiratory sensitisation		Skin sensitisation
	Solid/liquid	Gas	All physical states
Skin sensitisation Category 1	-	-	≥ 1.0% (NOTE)
Skin sensitisation Sub-Category 1A	-	-	≥ 0.1%
Skin sensitisation Sub-Category 1B	-	-	≥ 1.0% (NOTE)
Respiratory sensitisation Category 1	≥ 1.0% (NOTE)	≥ 0.2% (NOTE)	-
Respiratory sensitisation Sub-Category 1A	≥ 0.1%	≥ 0.1%	-
Respiratory sensitisation Sub-Category 1B	≥ 1.0% (NOTE)	≥ 0.2% (NOTE)	-

NOTE: A SDS will still be required if the ingredient is present in the mixture at a concentration of ≥ 0.1%.

Table 6. Classification of mixtures containing carcinogens

Ingredient classification	Generic concentration limits triggering classification of a mixture as	
	Category 1 carcinogen	Category 2 carcinogen
Category 1 carcinogen	≥ 0.1%	-
Category 2 carcinogen	-	≥ 1.0% (NOTE)

NOTE: A SDS will still be required if the ingredient is present in the mixture at a concentration of ≥ 0.1%.

Table 7. Classification of mixtures containing reproductive toxicants

Ingredient classification	Generic concentration limits triggering classification of a mixture as		
	Category 1 reproductive toxicant	Category 2 reproductive toxicant	Additional category for effects on or via lactation
Category 1 reproductive toxicant	≥ 0.3% (NOTE)	-	-
Category 2 reproductive toxicant	-	≥ 3.0% (NOTE)	-
Additional category for effects on or via lactation	-	-	≥ 0.3% (NOTE)

NOTE: A SDS will still be required if the ingredient is present in the mixture at a concentration of ≥ 0.1%.

Table 8. Classification of mixtures containing specific target organ toxicants (single exposure)

Ingredient classification	Generic concentration limits triggering classification of a mixture as		
	Category 1 specific target organ toxicant	Category 2 specific target organ toxicant	Category 3 specific target organ toxicant
Category 1 specific target organ toxicant	$\geq 10\%$ (NOTE 1)	$1.0\% \leq$ concentration $< 10\%$	-
Category 2 specific target organ toxicant	-	$\geq 10\%$ (NOTE 1)	-
Category 3 specific target organ toxicant	-	-	$\geq 20\%$ (NOTE 2)

NOTE 1: A SDS will still be required if the ingredient is present in the mixture at a concentration of $\geq 1.0\%$.

NOTE 2: It shall be recognised that this concentration limit may be higher or lower depending on the Category 3 ingredient(s) and that some effects such as respiratory tract irritation may not occur below a certain concentration while other effects may occur below this 20% value. Expert judgement should be exercised.

Table 9. Classification of mixtures containing specific target organ toxicants (repeated exposure)

Ingredient classification	Generic concentration limits triggering classification of a mixture as	
	Category 1 specific target organ toxicant	Category 2 specific target organ toxicant
Category 1 specific target organ toxicant	$\geq 10\%$ (NOTE)	$1.0\% \leq$ Concentration $< 10\%$
Category 2 specific target organ toxicant		$\geq 10\%$ (NOTE)

NOTE: A SDS will still be required if the ingredient is present in the mixture at a concentration of $\geq 1.0\%$.

SAFETY DATA SHEET

What are GHS Safety Data Sheets (SDS)?

These SDS are in a standardised format with information about the physical properties of the chemicals, their health effects, and safety measures on handling, storing, transporting and disposal of the chemicals, as well as first aid and emergency responses.

Why need GHS SDS?

GHS SDS is a universal hazard communication tool, which helps to ensure the safe use of hazardous chemicals by enabling users to:

- Identify the hazards of the chemical
- Assess the risk involved in handling the chemical
- Take the precautionary measures to eliminate or minimize the risk

The information and data in the SDS are essential for establishing a comprehensive chemical safety programme covering all stages in the life cycle of the chemicals.

Review and update of SDS

The chemical manufacturers or suppliers of SDS should review the information periodically (not longer than 5 years from the last date of issue of the SDS, revise and update within 6 months after the review) and if necessary reissue the SDS taking the following into consideration:

- When there is a change in formulation that changes the properties of the substance, the form or physical appearance or the way of application of the substance
- When there is a change to the substance/mixture that changes the health, safety or environmental hazard nature
- When there is available new health, safety or environmental information such as occupational exposure levels of the substance/mixture
- When there are new (or revised) regulations, standards, codes of practices or guidelines

When there is a change in company's information, contact number and emergency response number, the chemical manufacturer or supplier of SDS should inform the employer or workplace occupier accordingly.

Which chemicals require GHS SDS?

SDS must be prepared for every chemical substance or product that has been classified as hazardous under the GHS e.g. toxic, flammable, oxidising, pyrophoric, explosive, self-reactive, corrosive, irritant, sensitising, narcotic, mutagenic, carcinogenic, reproductive, specific target organ toxicity, and environmental toxicity.

The information for classification can be obtained from laboratory tests, published data and literature, and field experience.

The concentration cut-off in which an SDS is required is summarized in Table 10.

Table 10. Concentration Cut-off for SDS

Hazard Class	Cut-off value / Concentration Limit
Acute toxicity, Category 1-3	$\geq 0.1\%$
Acute toxicity, Category 4	$\geq 1.0\%$
Skin corrosion/irritation	$\geq 1.0\%$
Serious eye damage/irritation	$\geq 1.0\%$
Respiratory sensitisation	$\geq 0.1\%$
Skin sensitisation	$\geq 0.1\%$
Germ cell mutagenicity category 1	$\geq 0.1\%$
Germ cell mutagenicity category 2	$\geq 1.0\%$
Carcinogenicity	$\geq 0.1\%$
Reproductive toxicity	$\geq 0.1\%$
Specific target organ toxicity (single exposure)	$\geq 1.0\%$
Specific target organ toxicity (repeated exposure)	$\geq 1.0\%$
Aspiration hazard, category 1	$\geq 10\%$
Hazardous to the aquatic environment	$\geq 1.0\%$
Hazardous to ozone layer	$\geq 0.1\%$

How does SDS serve as a hazard communication tool?

SDS provides a communication link between chemical manufacturers/suppliers and workplace occupiers/employers who purchase the chemicals, and between employers and employees who use or handle the chemicals.

Under the Workplace Safety and Health (WSH) Act, it is the duty of employers to ensure that persons at work have adequate instruction, information, training and supervision to perform their work. SDS can be used to facilitate training of persons at work.

What are your obligations / statutory duties?

Chemical manufacturers and suppliers

- Provide GHS SDS with accurate and sufficient information in the GHS format for their products.
- Ensure that the following information is available to any person to whom the product is supplied for use at work: the health hazards associated with the product, the precautions to be taken, and the results of any tests that are relevant to its safe use.

Workplace occupiers / employers

- Obtain GHS SDS and assess the information in the SDS.
- Make the SDS available to persons who are liable to be exposed to the chemical.
- Conduct a risk assessment for work involving chemicals and develop safe work procedures.
- Take precautionary measures to ensure the safe use of the chemical.

Employees

- Know the hazards of the chemicals e.g. understand the pictograms.
- Follow the safe work procedures.
- Use personal protective equipment (PPE) as required.

Emergency response team

- Use correct mitigation to manage chemical incidents.

What are the exceptions?

- There is no exemption for chemical substances or mixtures from GHS except for chemicals that have been classified as non-hazardous by GHS hazard classification criteria and do not contain any hazardous ingredients above the SDS cut-off limits (in SS586 on Specification for Hazard Communication for Hazardous Chemicals and Dangerous Goods).
- Pharmaceuticals, food additives, cosmetics and pesticide residues in food will not be subject to GHS in terms of labelling at the point of intentional intake. However, these products will not be covered in terms of labelling at the point of intentional intake. However, they will be covered where workers are exposed in the workplace and in transport.
- Hazardous substances that are in a consumer package and that are intended for retail sale, are exempted from SDS requirements under the WSH (General Provisions) Regulations.
- The term consumer package means a container that is intended for retail display and sale to households or offices, and includes a container that is transported or distributed as part of a larger consolidated container that consists of a number of identical consumer packages. The term container means anything in or by which substances are or have been wholly or partly encased, covered or packed.
- For more information on the WSH (General Provisions) Regulations, please refer to the MOM website at <http://www.mom.gov.sg>.

What is the key information that users should obtain from the SDS?

The identity of the chemical, the hazards associated with the chemical and the precautions to take when handling the chemical. These are the key information items to look out for. It is important to request for an updated SDS from the manufacturer/supplier/seller.

Identification

- What is the name or the identity of the chemical?

Hazard identification

- Can the chemical burn or explode when ignited?
- Is the chemical stable? If no, what are the conditions to avoid?
- Can the chemical react with other chemicals? If yes, which chemicals?
- Is the chemical harmful? If so, what harm can it cause?
- Do you know the symptoms that may warn you of overexposure?

Preventive measures

- Does the chemical require special handling & storage?
- What type of personal protective equipment should you use when you are handling the chemical?

Emergency measures

- Do you know what to do in the event of a fire or explosion?
- Do you know the fire extinguishing method for the chemical?
- Do you know what to do in the event of a leak or spill?
- Do you know the first-aid to be administered to the victims?

What must GHS SDS contain?

GHS SDS must contain 16 information items in the following sequence:

1. *Identification*

- product identifier
- recommended use of chemical and restrictions
- supplier's details
- emergency phone number

2. *Hazards identification*

- GHS classification of substance/mixture
- GHS label elements, all precautionary statements and all hazard information/ statements

3. *Composition / information on ingredients*

- chemical identity, CAS number
- concentrations of all ingredients, impurities and stabilizing additives

4. *First aid measures*

- description of acute and delayed symptoms / effects
- indication of medical attention and special treatment needed, if necessary

5. *Fire fighting measures*

- suitable extinguishing media, special protective actions for fire-fighters
- special hazards arising from the chemical

6. *Accidental release measures*

- personal precautions, protective equipment, emergency procedures
- environmental precautions
- methods and materials for containment and cleaning up

7. *Handling and storage*

- precautions for safe handling
- conditions for safe storage, including any incompatibilities

8. *Exposure controls / personal protection*

- occupational exposure or biological limit values
- appropriate engineering controls
- individual protection measure

9. *Physical and chemical properties*

- appearance, odour, odour threshold and pH
- flash point and evaporation rate
- initial boiling point and boiling range
- upper/lower flammability or explosive limits
- melting point/ freezing point
- vapour pressure, density and relative density
- partition coefficient: n-octanol/water
- auto-ignition and decomposition temperature
- flammability, solubility and viscosity

10. *Stability and reactivity*

- reactivity and chemical stability
- possibility of hazardous reactions
- conditions to avoid, incompatible materials and hazardous decomposition products

11. *Toxicological information*

- description of the various delayed, immediate and chronic toxicological (health) effects through short or long term exposure via inhalation, ingestion, skin and eye contact
- symptoms related to physical, chemical and toxicological characteristics

12. *Ecological information*

- eco-toxicity
- persistence and degradability
- bio-accumulative potential
- mobility in soil

13. *Disposal considerations*

- description of waste residues and information on their safe handling and methods of disposal

14. *Transport information*

- UN number and UN proper shipping name
- transport hazard classes and packing group, transport in bulk
- marine pollutant
- transport in bulk
- special precautions a user should take in transporting substance

15. *Regulatory information*

- safety, health and environmental regulations specific for the product in question

16. *Other information*

- other information that may be of importance to safety and health

GHS LABEL



GHS Label

The objective of labelling of product packages and workplace chemical containers containing hazardous chemicals is to enable users to know the identities of the chemicals they handle, the hazards involved and the precautionary measures to take.

Legal Requirements on Product Package and Workplace Chemical Container Labels

Regulation 42 (Warning Labels) of the Workplace Safety and Health (General Provisions) Regulations stipulates that it shall be the duty of the occupier of a workplace in which there is any container of hazardous substances to ensure that, as far as reasonably practicable, every such container is affixed with one or more labels that are in accordance with:

- (1) any Singapore Standard relating to the classification and labelling of hazardous substances; or
- (2) such other standards, codes of practice or guidance relating to the classification and labelling of hazardous substances as issued or approved by the WSH Council.

Singapore Standard SS 586 Specification for Hazard Communication for Hazardous Chemicals and Dangerous Goods is an Approved Code of Practice that adopts the United Nations Globally Harmonised System of Classification and Labelling of Chemicals.

Regulation 44 exempts any hazardous substance that is in a consumer package and that is intended for retail sale, from labelling and SDS requirements.

Exemptions

- There is no exemption for chemical substances or mixtures from GHS except for chemicals that have been classified as non-hazardous by GHS hazard classification criteria and do not contain any hazardous ingredients above the SDS cut-off limits specified in SS 586.
- Pharmaceuticals, food additives, cosmetics and pesticide residues in food will not be subject to GHS in terms of labelling at the point of intentional intake. However, these products will not be covered in terms of labelling at the point of intentional intake but will be covered where workers are exposed in the workplace and in transport.

Information on a GHS Label for Product Package/Containers

There are seven information items required in a GHS label.

1. Product Identifier
2. Pictogram
3. Signal word
4. Hazard statement
5. Precautionary statement
6. Supplementary information
7. Supplier information

Understanding the information on a label enables users to handle the hazardous chemical safely.

What does the information mean?

1. PRODUCT IDENTIFIER










A product identifier is the name of the product in accordance with IUPAC, CAS or technical names listed on the SDS for the product. It provides a unique means by which a user can identify the product in a particular use setting e.g. transport or workplace.

Where a substance or mixture is covered under the UNRTDG, the UN Proper Shipping Name should also be used.

2. PICTOGRAM

A pictogram conveys the hazardous properties and hazard severity of a chemical. There are nine GHS pictograms assigned to different classes and categories of chemical hazards (Table 11). Every product should be properly classified and assigned appropriate pictogram(s).

Table 11. GHS pictograms and hazard classes

Pictograms and Hazard Classes		
 <p>Oxidiser</p>	 <ul style="list-style-type: none"> • Flammables • Aerosols • Self-reactive • Pyrophoric • Self-heating • Emits flammable gas 	 <ul style="list-style-type: none"> • Explosive • Self-reactive • Organic peroxide
 <p>Acute toxicity (severe)</p>	 <p>Corrosive</p>	 <p>Gases under pressure</p>
 <ul style="list-style-type: none"> • Carcinogen • Respiratory sensitiser • Reproductive toxicity • Target organ toxicity • Mutagenicity • Aspiration toxicity 	 <p>Environmental toxicity</p>	 <ul style="list-style-type: none"> • Irritant • Skin sensitiser • Acute toxicity • Narcotic effects • Respiratory tract irritation • Hazardous to the ozone layer

3. SIGNAL WORDS

These words are used to indicate the relative hazard severity and alert the reader to a potential hazard. There are 2 signal words used on a GHS label - "Danger" is for a more severe hazard while "Warning" is for a less severe hazard.

4. HAZARD STATEMENTS

These are phrases assigned to a hazard class and category to describe the nature and degree of the hazards of the product. All hazard statements should be included on the label for substance/ mixture possessing more than one hazard.

5. PRECAUTIONARY STATEMENTS

These are phrases /precautionary pictograms which describe recommended measures that should be taken to minimise or prevent adverse effects resulting from exposure to a hazardous product, or improper storage or handling of a hazardous product. The number of precautionary statements should be kept to a maximum of six.

6. SUPPLEMENTARY INFORMATION

The supplementary information on the label of a product is provided by the manufacturer or supplier at its discretion. Example:

- For further information on this product, see Safety Data Sheet.

Such information should not lead to variation or undermine the GHS hazard information.

7. SUPPLIER INFORMATION

This is the name, address and telephone number of the manufacturer or supplier of the product.

Review / Update of Label

The labels are to be updated within six months whenever there is any new information received on the label information items.

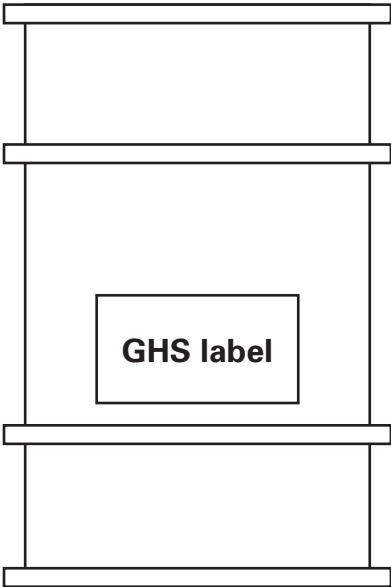
Information on the label is to be reviewed by manufacturer or supplier every five years.

Labelling of Product Packages and Workplace Chemical Containers - the GHS Label


Original product packages/workplace chemical containers/warning label provided by manufacturers or suppliers would have the GHS labels on them. The dimensions of label are shown in Table 12.

Table 12. Dimensions of label

Capacity of container	Dimensions (in millimetres)
125ml – 3 litres	If possible, at least 52 x 74
Greater than 3 litres but not exceeding 50 litres	At least 74 x 105
Greater than 50 litres but not exceeding 500 litres	At least 105 x 148
Greater than 500 litres	At least 148 x 210



Example of GHS container label

Product name	Isopropyl Alcohol		Pictograms
Signal word	DANGER		
Hazard Statements	<p>Highly flammable liquid and vapour</p> <p>Causes serious eye irritation</p> <p>May cause drowsiness or dizziness</p> <p>May be harmful if swallowed and enters airways</p> <p>May cause respiratory irritation</p>		
Precautionary Statements	<ul style="list-style-type: none"> - Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking. - Take precautionary measures against static discharge. - Use only outdoors or in well-ventilated area. - Avoid breathing dust/fume/gas/mist/vapours/ spray. - Wear protective gloves/ protective clothing/ eye protection/ face protection. - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing <p>Rinse skin with water/shower.</p>		
Supplementary Information	<p><i>Empty uncleaned drums can still be dangerous, keep labelled until decontaminated, then remove or deface the label.</i></p> <p><i>For further information on this product, refer to Safety Data Sheet.</i></p>		
Supplier Information	<p>United Nations Chemical Company Ltd.</p> <p>1-1, Peace Avenue</p> <p>Jurong Island Annex A,</p> <p>Singapore 123456.</p> <p>Contact number: 65 6000 0000</p> <p>Emergency contact number: 65 6123 4567</p>		

Disclaimer: Label is produced not to scale and with available known data at the point of print.

Reduced Workplace Labelling

Where a full GHS label is not practicable, a reduced workplace label shall be provided. Reduced workplace labels are labels which indicate only:

- Product identifier
- GHS pictogram(s)

Before implementing reduced workplace labelling in the workplace, persons who are handling hazardous chemicals must be trained and able to interpret label and understand the hazards and precautionary measures to take.

The conditions under which reduced workplace labelling can be used are:

1. Hazardous chemicals in containers $\leq 125\text{ml}$
2. Hazardous chemicals that are decanted, transferred or dispensed to secondary containers
3. Hazardous chemicals which are not supplied to another workplace
4. Hazardous chemicals used in laboratories
5. Hazardous chemicals to be sent for research and analysis



Figure 1. Example of reduced workplace label



Figure 2. Reduced workplace label on bottle

HAZARD COMMUNICATION



Hazard Communication Training

Persons at work who are required to handle hazardous chemicals shall be trained and supervised as is necessary for the persons to perform their work. Persons at work who are liable to be exposed to hazardous chemicals shall be informed or instructed of the hazards involved and the precautionary measures to be taken.

Hazard communication training should cover:

- Hazardous chemicals in the workplace and their hazards
- Control or preventive measures and safe work procedures to minimise the hazards
- Procedures to follow if they are exposed to the hazards
- Emergency response procedures
- Reading and interpreting labels and SDS

Please refer to SS586: 2014 Part 2 Section 8 for more details on hazard communication programme.

RESOURCES

More Guidance Materials on GHS

1. Singapore Standard SS 586:2014 on Specification on Hazard Communication for Hazardous Chemicals and Dangerous Goods. Details on purchasing can be found at <http://www.singaporestandardseshop.sg/Product/Home.aspx>
2. Guidebook on GHS of Classification and Labelling of Chemicals (by SCIC). Details on purchasing can be found at <http://www.scic.sg/>
3. Workplace Safety and Health Act (WSHA) and its related legislation can be downloaded from <http://www.mom.gov.sg/legislation/occupational-safety-health/Pages/default.aspx>
4. United Nation's GHS document and it can be downloaded from http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html
5. For latest information on implementation of GHS in Singapore, please refer to the GHS website. <https://www.wshc.sg/ghs>

[illegible]

Acknowledgement

This booklet was prepared by the National GHS Task Force (formed under the custody of the Ministry of Manpower) to coordinate the implementation of GHS in Singapore. The Task Force comprising representatives from AVA, CAAS, HSA, MOM, MPA, MTI, NEA, SCDF, SCIC, SISO, SPF and WSHC.



The Task Force would like to thank the Singapore Chemical Industry Council Limited for allowing it to reproduce information from its Guidebook on GHS of Classification and Labelling of Chemicals.

Disclaimer

The GHS Task Force does not accept any responsibility for any errors or omissions. It is believed to be factual at time of print, with the available information and is for guidance only.

No portions of this publication may be reproduced without the permission of the publisher.