Department of Natural Resources, Mines and Energy

RS 17 Recognised Standard for Hazardous Chemicals

Coal Mining Safety and Health Act 1999

July 2019

Queensland Government

This Recognised Standard is based on national codes of practice developed by Safe Work Australia and approved by the Workplace Relations Ministers' Council in 2011, as part of the harmonization of work health and safety laws.

This publication has been compiled by Resources Safety and Health, Department of Natural Resources Mines and Energy.

This document is issued in accordance with PART 5 – Recognised standards of the *Coal Mining Safety and Health Act 1999* (the Act). Section 37(3) of the Act provides for the way recognised standards affect the discharge of safety and health obligations. Extracts of Part 5 and section 37(3) of the Act are provided below.

Part 5 Recognised standards

71 Purpose of recognised standards

A standard may be made for safety and health (a ***recognised standard***) stating ways to achieve an acceptable level of risk to persons arising out of coal mining operations.

72 Recognised standards

(1) The Minister may make recognised standards.
(2) The Minister must notify the making of a recognised standard by gazette notice.
(3) The chief executive must keep a copy of each recognised standard and any document applied, adopted or incorporated by the recognised standard available for inspection, without charge, during normal business hours at each department office dealing with safety and health.
(4) The chief executive, on payment by a person of a reasonable fee decided by the chief executive, must give a copy of a recognised standard to the person.

73 Use of recognised standards in proceedings

A recognised standard is admissible in evidence in a proceeding if -

(a) the proceeding relates to a contravention of a safety and health obligation imposed on a person under part 3; and
(b) it is claimed that the person contravened the obligation by failing to achieve an acceptable level of risk; and
(c) the recognised standard is about achieving an acceptable level of risk.

Part 3 - Safety and health obligations

37 How obligation can be discharged if regulation or recognised standard made

(3) If a recognised standard states a way or ways of achieving an acceptable level of risk, a person discharges the person's safety and health obligation in relation to the risk only by—
(a) adopting and following a stated way; or
(b) adopting and following another way that achieves a level of risk that is equal to or better than the acceptable level.

Where a part of a Recognised Standard or other document referred to in the Recognised Standard conflicts with the Coal Mining Safety and Health Act 1999 or the Coal Mining Safety and Health Regulation 2017 (the Regulation), the Act or Regulation takes precedence.

This Recognised Standard was issued under the authority of the Minister for Natural Resources, Mines and Energy.

[Gazetted 19 July 2019].

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Recognised Standard for Hazardous Chemicals

Part 1– Classification and labelling of workplace hazardous chemicals

Coal Mining Safety and Health Act 1999

Scope and application of Part 1

This Recognised Standard applies to substances, mixtures, and articles used, handled or stored at a coal mine and which are defined as hazardous chemicals or under the CMSHR.

While this Recognised Standard applies to hazardous chemicals as defined, it is recommended practice to provide a label for any chemical that is suspected of producing adverse health, safety or environmental effects but has insufficient information generated to allow it to be correctly classified. The label should reflect current state of knowledge.

This Recognised Standard provides practical guidance to persons involved in the manufacture, import, supply, use, handling or storage of hazardous chemicals on how to correctly label hazardous chemicals used, handled or stored at a coal mine.

1 Part 1—Introduction

This Recognised Standard describes when hazardous chemicals must be classified and the type of information that is needed on labels for various hazardous chemicals. The labelling information required is so that users of these chemicals in workplaces can identify any hazards associated with the correct classification of the chemical and take appropriate steps to eliminate or minimise the risks.

1.1 What are the obligations in relation to labelling hazardous chemicals?

The CMSHA and CMSHR apply specific obligations on various persons in relation to the correct labelling of workplace hazardous chemicals. These obligations are summarised below.

Obligation holder	Responsibilities
Manufacturers and importers (s46 CMSHA)	A manufacturer or importer of a substance for use at a coal mine has the following obligations— (a) to ensure the substance is safe so that, when used properly, the risk to persons from the use of the substance is at an acceptable level; (b) to ensure the substance undergoes appropriate levels of testing and examination to ensure compliance with the obligation imposed by paragraph (a).
Manufacturer, importer and supplier (s46 CMSHA)	Also, a manufacturer, importer or supplier of a substance for use at a coal mine has the following obligations— (a) to ensure appropriate information about the safe use, storage and disposal of the substance is provided with the substance; (3) For subsection (2)(a), information is appropriate if the information clearly identifies the substance and states— (a)the precautions, if any, to be taken for the safe use, storage or disposal of the substance; and (b) the risks, if any, associated with the use, storage or disposal of the substance.
Manufacturers, importers and suppliers must mark or label substances (s56B CMSHR)	1) This section applies to a manufacturer, importer or supplier of a substance for use at a coal mine as mentioned in section 46(2)(a) of the Act. (2) Without limiting section 46(2)(a) of the Act, the manufacturer, importer or supplier must ensure the substance is correctly marked or labelled when the substance is provided for use at the mine. (3) A substance is correctly marked or labelled if the mark or label complies with applicable requirements relating to the mark or label stated in— (a) the GHS; or (b) a guideline; or (c) the ADG Code
Site Senior Executive (s56C CMSHR)	(1) The site senior executive for a coal mine must ensure the following things are correctly marked or labelled— (a) a hazardous chemical used, handled, stored or produced at the mine; (b) dangerous goods used, handled, stored or produced at the mine; (c) any thing containing, or being used to transport, a hazardous chemical mentioned in paragraph (a) or dangerous goods mentioned in paragraph (b). (2) A hazardous chemical, dangerous goods, or a thing mentioned in subsection (1)(c) is correctly marked or labelled if a mark or label— (a) warns persons of the presence of the chemical or goods; and

Obligation holder	Responsibilities
	(b) identifies the chemical or goods; and (c) to the extent necessary for managing risk, provides basic information about using, handling, storing, producing or transporting the chemical or goods. (3) If it is not practicable to mark or label a hazardous chemical mentioned in subsection (1)(a), or dangerous goods mentioned in subsection (1)(b), the site senior executive must ensure a notice that gives the warning, identification and basic information mentioned in subsection (2)(c) is placed in a conspicuous place as near as practicable to the chemical or goods. (4) Also, the site senior executive must ensure a mark, label or notice under this section complies with applicable requirements relating to the mark, label or notice stated in— (a) the GHS; or (b) a guideline; or (c) the ADG Code; or (d) AS 1345, (5) This section does not apply in relation to a mineral or quarry material. (6) In this section— AS 1345 means the Australian Standard for the identification of the contents of piping, conduits and ducts as in force from time to time under that designation (regardless of the edition or year of publication of the standard).

Note: a person who packages or re-labels a hazardous chemical with their own product name is considered to be a manufacturer and therefore will have the same obligations as the manufacturer or importer under the CMSHA and CMSHR.

1.2 When must a hazardous chemical be classified?

The manufacturer or importer of a substance, mixture or article must, before first supplying it to a mine:

(a) determine whether the substance, mixture or article is a hazardous chemical; and

(b) if the substance, mixture or article is a hazardous chemical—ensure that the hazardous chemical is correctly classified.

A substance or mixture (other than a research chemical, sample for analysis or waste product) is correctly classified if a determination is made about whether the substance or mixture can be classified into a hazard class under the GHS including a mixture classification referred to in Appendix 1-B.

Note: The Appendix 1-B tables replace some tables in the GHS.

A substance or mixture that is a research chemical, sample for analysis or waste product is correctly classified if, having regard to the known or suspected properties of the substance or mixture:

(a) a determination is made about the identity of the substance or mixture; and

(b) a determination is made about whether the substance or mixture can be classified into a hazard class under the GHS.

An article that contains a substance or mixture that may be released during the use, handling, transport or storage of the article also needs to be correctly classified. Additionally, a mining or

quarrying operation may need to classify its ore source, products and waste materials (solids, liquids and gases) prior to commencement of operations. While there are certain exemptions for *labelling* of hazardous chemicals that are minerals or quarry products (as defined below), this does not extend to the classification of hazardous chemicals. The classification is vital in determining appropriate controls of chemical hazards for workers.

Examples of hazardous chemicals that are minerals may include concentrates; dusts that contain high levels of hazard materials such as respirable crystalline silica, or waste streams that contain hazardous chemicals.

Note: To remove any doubt, classification is only required where there exists a potential health risk from the chemical or substance. Coal, as part of the normal mining and processing, is not considered hazardous in its normal lump form as it is not respirable. Any dust generated during otherwise normal operations should be treated as any other occupational exposure risk such as respirable crystalline silica. However if, for example, coal is intentionally pulverised for sale to another party then it may be considered hazardous due to the respirable dust that may be generated due to the nature of the product.

1.3 When is a label under the CMSHR NOT required?

In general, a label is required for any substance, mixture or article classified as a hazardous chemical under the CMSHR. However, there are several types of hazardous chemical that are excluded from the labelling provisions or exempted from coverage from all provisions under this Recognised Standard.

1.3.1 Mineral or Quarry product

Mines and quarries rely on the successful bulk extraction of mineral and/or quarry products as part of their business. If a substance meets the definition of a mineral under the *Mineral Resources Act 1989* or a quarry product under the *Forestry Act 1959* then it is exempt from labelling as a hazardous chemical while it is within the bounds of the exploration or coal mining operations. Once a mineral or quarry product leaves the operations then it is subject to labelling and placarding under relevant legislation.

Note that, while unlikely in coal mining operations, in some cases placarding may still be required for stockpiles of material that meet the definition of a dangerous good under the ADG code, for example waste stockpiles containing arsenic compounds. In cases such as this, placards will still need to be erected to convey relevant information about the hazard.

1.3.2 Dual use products

Some hazardous chemicals may be intended for supply to both the consumer household markets and workplaces in identical containers and packaging. These products are sometimes referred to as dual use products. A dual use product label need only comply with the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) labelling requirements. If the manufacturer or importer determines that the use, handling and storage of the product are predominantly related to a work activity, the label must meet GHS requirements.

1.3.3 Food and beverages

Food and beverage products that are packaged in a form intended for consumption do not require labelling under this Recognised Standard. However, large or bulk quantities must be labelled to meet workplace requirements. For example, a 1000 L container of flammable alcoholic spirits must be labelled to meet the requirements, while a 750 mL bottle of the same spirits does not.

1.3.4 Therapeutic goods

Therapeutic goods are regarded as correctly labelled when labelled in accordance with Therapeutic Goods Administration (TGA) requirements and in a form:

- intended for intake or administration to or by a patient or consumer, or
- intended for use for therapeutic purposes.

When not in a form intended for intake or administration to or by a patient or consumer, or for therapeutic purposes, workplace labelling must be used.

For example, a pharmacist repacks a 1 kg container of formulated tablets in smaller containers for dispensing to patients. The 1 kg container must comply with TGA labelling requirements. However, a 1 kg container of the same material in powdered form used by a pharmacist in manufacturing or formulating products must be labelled according to workplace labelling requirements.

1.4 The meaning of key terms and abbreviations

ADG Code means the *Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th edition,* approved by the Australian Transport and Infrastructure Council. The ADG Code is accessible at the National Transport Commission website www.ntc.gov.au.

Container means anything in or by which a hazardous chemical is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container.

Hazardous chemical means any substance, mixture or article that satisfies the criteria for a hazard class in the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS) including a classification referred to in Appendix 1-B of this Recognised Standard, but does not include a substance, mixture or article that satisfies the criteria solely for one of the following hazard classes:

- acute toxicity - oral - Category 5
- acute toxicity - dermal - Category 5
- acute toxicity - inhalation - Category 5
- skin corrosion/irritation - Category 3
- serious eye damage/eye irritation - Category 2B
- aspiration hazard - Category 2
- flammable gas - Category 2
- acute hazard to the aquatic environment – Category 1, 2 or 3
- chronic hazard to the aquatic environment - Category 1, 2, 3 or 4, or
- hazardous to the ozone layer.

Label means the written, printed or graphical information elements concerning a hazardous chemical that is affixed to, printed on or attached to the container of a hazardous chemical.

Further definitions and abbreviations used in this Recognised Standard are listed in Appendix 1-A.

2 Labelling hazardous chemicals– general information

This chapter deals with the complete set of labelling elements that should be included on a container. A checklist for the preparation of a label is provided in Appendix 1-C. In some situations it is not possible or reasonably practicable to legibly include the complete set of labelling elements on a label. Reduced label requirements are permitted in such situations. Guidance on the label requirements for these and other special situations is provided in Chapter 3 of this Recognised Standard.

2.1 What information must be included on a label?

A hazardous chemical is correctly labelled if the chemical is packed in a container that includes the following:

- is written in English
- the product identifier
- the name, Australian address and business telephone number of either the manufacturer or importer
- the identity and proportion disclosed, in accordance with Appendix 3-B, for each chemical ingredient
- any hazard pictogram(s) consistent with the correct classification(s) of the chemical
- any hazard statement(s), signal word and precautionary statement(s) that is consistent with the correct classification(s) of the chemical
- any information about the hazards, first aid and emergency procedures relevant to the chemical, which are not otherwise included in the hazard statement or precautionary statement, and
- the expiry date of the chemical, if applicable.

You may include any information on the label that does not contradict or cast doubt on any other information that is required on the label.

The following additional information should also be included on the label, where available:

- an emergency phone number, for specific poisons or treatment advice
- the overseas name, address and telephone number of the manufacturer or supplier
- a valid website or internet address
- reference to the safety data sheet, for example a statement on the label that says: “Additional information is listed in the safety data sheet”.

2.2 Product identifier, including details of ingredients

Information on the identity of a product includes a product identifier and the disclosure of certain ingredients. The product identifier and details of ingredients should be grouped together and located at the most prominent position on the label, for example at the top or centre of the label, or on a front panel.

A product identifier is a unique name or number by which the chemical is to be known, and which allows the product users to identify the hazardous chemical. The product identifier must be the same as that listed in the safety data sheet, and may be identical to the trade name.

A label must identify those ingredients, including their proportions, which contribute to the overall hazard class and hazard category of the hazardous chemical in accordance with Part 3

Preparation of Safety Data Sheets. Disclosure of ingredient names is not required for ingredients that meet only physicochemical and/or environmental hazard classifications.

For pure substances, the identity of an ingredient can be identical to the product identifier.

The identity of a hazardous ingredient must be disclosed on a label using its *chemical identity*, unless the use of a generic name is permitted. The chemical identity of the hazardous ingredient can be disclosed by any of the following:

- the IUPAC name
- the CAS name
- the technical name (if different from the IUPAC or CAS name), which must be generally used in commerce, regulations and codes to identify a substance or mixture, and recognised by the scientific community.

  Note: Trade names are not acceptable as technical names.

A generic name may be used to describe a hazardous ingredient if:

- the identity of the ingredient is commercially confidential, and
- an exposure standard has not been established for the ingredient, and
- the hazardous ingredient meets the criteria for any of the following GHS hazard classes and categories, and no other GHS health hazard classes and categories:
  - acute toxicity – Category 4 (oral, dermal, inhalation)
  - aspiration hazard – Category 1
  - serious eye damage/ eye irritation – Category 2A
  - skin corrosion/irritation – Category 2
  - specific target organ toxicity (single exposure) – Category 3.

A guide for selecting generic names for ingredients is included in Appendix 1-D of this Recognised Standard.

2.2.1 For complex mixtures

The identity of all hazardous ingredients in a complex mixture must be determined so far as is reasonably practicable. In some situations it may be difficult to identify individual ingredients for example in natural products or extracts where the chemical composition of the mixture may vary according to the source. In these circumstances, technical names may be used to identify hazardous ingredients.

The ingredient and formulation details for hazardous complex mixtures must include as much information as possible. Chemical families or sub-families should be distinguished wherever possible. Chemical sub-families that may be used to represent a mixture of ingredients in complex mixtures include aliphatic hydrocarbons, aromatic hydrocarbons, aliphatic alcohols, aliphatic aldehydes and silicates.

2.2.2 Disclosing proportions of ingredients

The proportion of a disclosed ingredient, expressed as a weight or volume percentage of the hazardous chemicals must be described as an exact proportion, unless the exact concentration of an ingredient is commercially confidential. For multiple ingredients, proportions of hazardous ingredients should be listed in descending order by mass or volume.

Where the proportions of ingredients in the hazardous chemical are commercially confidential, the following ranges—or a narrower range as described in the paragraph immediately below—must be

used as an alternative to disclosing exact proportions:

- <10%
- 10- <30%
- 30 – 60%
- >60%

The proportion of an ingredient may be disclosed using a narrower range than the applicable range listed above. For example, for an ingredient present at 35%, a range of 30 - 40% may be used instead of 30 - 60%.

For complex mixtures, proportion ranges should be used to cover any variability in the composition. Where the exact composition of a complex mixture is not known, this should be clearly indicated on the label.

Where possible, the percentage composition should add up to or indicate a total of 100%, even if an estimate of non-hazardous ingredients needs to be provided.

Example of how ingredients can be represented on the subsection of a label

Flammable Liquid A contains the following ingredients:

Toluene	55 %
Ethyl methyl ketone	40 %
Methanol	3.5 %
2-Butanol	1 %
Xylene	0.5 %

As both xylene and 2-butanol are not hazardous to health at these concentrations, they do not need to be disclosed in the ingredients subsection of the label.

Note: as they both have exposure standards they should be disclosed on the label as good practice.

The ingredients and their proportions may be disclosed on the label using the exact proportions:

Flammable Liquid A, contains:

Toluene	55 %
Ethyl methyl ketone	40 %
Methanol	3.5 %
Non-hazardous ingredients	1.5%

If the ingredient proportions are commercial-in-confidence, they may be disclosed on the label using a range:

Flammable Liquid A, contains:

Toluene	30 - 60 %
Ethyl methyl ketone	30 - 60%
Methanol	<10 %

2.3 Manufacturer/importer information

The label must include the Australian contact details of the manufacturer or importer.

Additional information, including details of an overseas manufacturer or supplier – for example, a website or internet address – may be included on the label.

The manufacturer or importer identification may be provided in a less-prominent position on the label, for example the back portion of the label. It should be grouped with the expiry date, where applicable.

2.4 Label elements

The combination of label elements required on the label of a hazardous chemical is directly linked to its hazard classification. Label elements apply to classification endpoints or hazard categories and must be determined as specified in the GHS.

Appendix 1-D includes tables listing all the elements that apply to each hazard class and category or division.

The potential exists for duplication or redundancy of certain label elements where a hazardous chemical meets the criteria for more than one hazard class or category in the GHS. Duplicate or redundant information should not be included on a label. Rules of precedence of certain label elements and general guidance that should be used to determine when elements may be omitted from a label are provided in Appendix 1-E.

Some hazardous chemicals, for example dangerous goods which cannot otherwise be classified into any hazard class described in the GHS, will not have any corresponding label elements. For these hazardous chemicals, hazard pictograms, hazard statements, signal words and precautionary statements cannot be included on the label. The labels for these products should include information on the hazards and safety precautions. For example, for dry ice (solid carbon dioxide), information on the asphyxiation hazard and precautions for handling to avoid cryogenic burns should be included on the label.

The signal word, hazard pictograms and hazard statements should be grouped together in a prominent position on the label, and located either immediately following or adjacent to the product identifier and chemical ingredients.

2.4.1 Signal words

Signal words are used to indicate the relative level of severity of a hazard. The GHS uses ‘Danger’ and ‘Warning’ as signal words. ‘Danger’ is used for a more severe or significant hazard, while ‘Warning’ is used for the less severe hazards.

Only one signal word should be present on any one label. If the signal word ‘Danger’ applies, then the signal word ‘Warning’ should not appear on the label.

Signal words should be represented in bold and uppercase text.

2.4.2 Hazard statements

Hazard statements describe the nature of a hazard, including the degree of hazard, where appropriate. A unique hazard statement is assigned to each hazard class and category. The hazard statements and corresponding hazard class and category are provided in Appendix 1-D. All relevant hazard statements must appear on the label. Where a hazard classification results in hazard statements with duplicate information, the information should only appear once, in line with the rules of precedence outlined in Appendix 1-E.

Additionally Appendix 1-D lists 12 non-GHS hazard statements that should be included on the label, where relevant.

A unique hazard statement code is assigned to each hazard statement. The hazard statement code is intended to be used for reference purposes only. It is not part of the hazard statement and should not be used to replace it or be included on the label.

Hazard statements should be represented in bold and sentence case text.

2.4.3 Precautionary statements

Precautionary statements describe the recommended measures that should be taken to minimise or prevent adverse effects resulting from exposure to, or improper storage or handling of, a hazardous chemical. Precautionary statements are assigned to each hazard class and category.

Precautionary statements are separated into five categories:

- Prevention statements refer to precautions to be taken to prevent an accident or exposure.
- Response statements refer to instructions in case of an accident.
- Storage statements refer to instructions for safe storage of the chemical.
- Disposal statements refer to appropriate disposal instructions.
- General statements for use as appropriate.

The precautionary statements that correspond to each hazard class and category are provided in Appendix 1-D. Not all precautionary statements relating to a particular hazard classification need to be used on the label. As a guide, a maximum of between six and ten precautionary statements should appear on the label, depending on the nature and severity of the hazards.

Where a hazard classification results in duplicate precautionary statements, the information should only appear once in line with the rules of precedence outlined in Appendix 1-F.

A combination of precautionary statements may be used to save label space, improve readability and to provide flexibility in the application of precautionary phrases.

Related precautionary statements should be grouped together on a label to allow for ease of location. Precautionary statements should be printed in sentence case text.

A unique precautionary statement code is assigned to each precautionary statement. The precautionary statement code is intended to be used for reference purposes only. It is not part of the precautionary statement and should not be used to replace it or be included on the label.

The general precautionary statements refer to general precautionary measures to be taken, for example:

- If medical advice is needed, have product container or label at hand.
- Keep out of reach of children.
- Read label before use.

Unlike other precautionary statements, general precautionary statements are not linked to particular hazard classes or categories and their inclusion on labels of workplace hazardous chemicals is not mandatory.

Where general precautionary statements are used, they should be located in a prominent position on the label, for example adjacent to the product identifier. General precautionary statements should be printed in sentence case text.

2.4.4 Hazard pictograms

The GHS specifies nine hazard pictograms, having regard to physical, health and environmental hazards. These are provided in Appendix 1-G of this Recognised Standard.

Hazard pictograms must be included on the label in most cases. In some circumstances however,

pictograms may be omitted from the label in line with the rules of precedence outlined in Appendix 1-F. In all other cases, where pictograms are required, all the relevant hazard pictograms must be included on the label.

Hazard pictograms should be in the shape of a square set at an angle of 45^{o} (i.e. diamond-shaped) on its point. The hazard pictograms should have a black symbol on a white background with a red border or frame of sufficient width to be clearly visible. Pictograms with a black border may also be used.

Class labels recommended for the transport of dangerous goods as specified in the ADG Code may be used instead of the relevant hazard pictograms specified in the GHS. Never use both in the same label. A comparison of the hazard pictograms as specified in the GHS and the ADG Code class labels are shown in Appendix 1-H[1].

2.5 Expiry Date

The expiry date for a chemical must be provided, where, for example degradation or decomposition of the chemical may occur over time, with the result that the hazard classification of the chemical changes, or where the chemical is no longer within acceptable specifications for potency and stability. For example ethers may form explosive peroxides over time.

An expiry date may be provided in a less prominent position of the label, for example the back portion of the label. It should be grouped with any manufacturer or importer identification information. An expiry date should be represented in sentence case text.

2.6 Pipe work

Pipelines and pipe-work used for the conveyance of hazardous chemicals must be identified. The identification used should communicate information relevant to the identity of the chemical, its hazards and any necessary precautions to be observed. Methods for identifying hazardous chemicals in pipe work may include:

- signs adjacent to pipe-work
- markings on the pipe-work, for example colour coding (refer to *AS 1345-1995 Identification of the contents of pipes, conduits and ducts*)
- schematic layouts displayed prominently.

[1] GHS pictograms can be downloaded from the GHS website at www.unece.org/trans/danger/publi/ghs/pictograms.html or *via* the GHS homepage at www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html. Transport of Dangerous Goods class labels can be downloaded from the National Transport Commission website at http://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

3 Special labelling situations

This chapter outlines requirements and guidelines for labelling hazardous chemicals in special situations where the full requirements do not apply. You should always aim to provide as much information on the hazards and safe use of the chemical on the label as possible.

Under the CMSHR, reduced labelling is permitted for hazardous chemicals that are:

- supplied in small containers
- research chemicals or samples for analysis
- decanted or transferred
- not supplied to another workplace, and where the hazards are known to the workers using the chemical
- hazardous wastes
- classified into the explosives hazard class and are not explosive articles.

This section also provides guidance on the acceptability of labels prepared in accordance with other labelling systems and handled in a workplace, specifically:

- hazardous chemicals classified in the explosive hazard class and labelled in compliance with the Australian Explosives Code (AEC)
- dangerous goods labelled in compliance with transport requirements[2]
- consumer products
- agricultural or veterinary chemical products that are labelled in accordance with the requirements of the Australian Pesticides and Veterinary Medicines Authority.

3.1 Small containers

Where a hazardous chemical is packaged in a container that is too small to attach a label with information that is required of hazardous chemical labels in general, then the label must be written in English and include the following:

- the product identifier
- the name, Australian address and business telephone number of either the manufacturer or importer.
- a hazard pictogram or hazard statement that is consistent with the correct classification of the chemical, and
- any other information required for hazardous chemicals labels in general that is reasonably practicable to include.

In addition to the mandatory items mentioned above, labels for small containers or packages must include as much labelling information required for hazardous chemical labels in general that is reasonably practicable to include. Priority should be given to the inclusion of those labelling elements relating to the most significant hazards of the hazardous chemical.

The most significant hazard will vary from chemical to chemical, and will be dependent upon, for example, likely routes of exposure based on its physical state (i.e. whether it is a gas, liquid or

[2] Dangerous goods that are labelled to comply with transport requirements and are stored in a workplace may also need to comply with requirements as specified in *the Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code).

solid), its packaging and its intended use.

3.1.1 Examples of the most significant hazard

- The information relating to a hazardous chemical's inhalation hazard properties may be considered most significant for a paint that is intended for application using a spray gun, but not where it is intended for application using a brush.
- The information relating to dermal toxicity may be considered most significant for a chemical that is packaged in an ampoule (i.e. where spillage could occur during opening), but not where the chemical is packaged in a ready-to-use syringe.

For hazardous chemicals with multiple hazard categories, the most stringent set of precautionary statements should be selected. This is appropriate for situations where rapid action or response may be crucial following accidental exposure, and therefore, information relating to these actions should be included in preference to non-critical information.

3.1.2 Example of the most stringent set of precautionary statements

- If a chemical can cause long term systemic effects, and is also acutely toxic, then the first aid measures for acute toxicity will normally take precedence over those for longer term effects. However, medical attention for the delayed health effects may be required in some cases of incidental exposure, even if it is not associated with immediate symptoms of exposure. Therefore, the information relevant to medical attention that is required due to delayed health effects may be applicable.

Where certain hazard or other information has been omitted from the label, then it is recommended that alternative means for communicating the information should be used. The complete set of hazard and other information may be included on an outer box (for example for a box containing several very small ampoules), a swing tag or insert, or a leaflet inside a box.

Examples of acceptable labels for small containers are provided in *Appendix I*.

3.2 Research chemicals or samples for analysis

A research chemical is a substance or mixture that has been manufactured in a laboratory for the purposes of genuine research and which is not for use or supply to others for a purpose other than genuine analysis or research. A chemical that is supplied commercially to another workplace is not included under the meaning of research chemical or samples for analysis under any circumstances.

If a hazardous chemical is used for research purposes only or is a sample for analysis, the label must, at a minimum, be written in English and include the product identifier and a hazard pictogram or hazard statement that is consistent with the correct classification of the chemical.

A research chemical or sample for analysis must be correctly classified and the identity of the substance or mixture must be determined.

The product identifier of a research chemical or sample for analysis may be:

- the actual name of the chemical
- a recognised abbreviation or acronym
- a chemical formula, structure or reaction components.

Where a research chemical or sample for analysis cannot be identified this should be indicated clearly on the label. Labels for research chemicals or samples for analysis should include as much hazard information as possible, based on the identity and the known or suspected hazards.

Where labelling the actual laboratory container is impractical due to its size or the conditions under

which it is used, other methods of providing the information can be used, for example a secure swing tag, a sign attached to supporting apparatus or labelling an outer container.

For example, for a rack of test tubes, rather than label each individual test tube containing the same hazardous chemical, you may attach a label to the rack using a swing tag.

3.3 Decanted or transferred hazardous chemicals

If a hazardous chemical has been decanted or transferred from the container in which it was packed and it will not be used immediately or it is supplied to someone else, the label must, at a minimum, be written in English and include the following:

- the product identifier, and
- a hazard pictogram or hazard statement consistent with the correct classification of the chemical.

For the purposes of this Recognised Standard, *decant* means to transfer a hazardous chemical from a correctly labelled container to another container within a workplace. Such a container may range from a small flask in a research laboratory to a large vessel that is used to contain reaction components prior to use in a mixing or reaction process.

Where the entire amount of a decanted hazardous chemical will be used immediately, labelling of its container is not required.

A decanted hazardous chemical can only be considered to be used immediately in situations where:

- it is not left unattended by the person who decanted it
- the decanted hazardous chemical is used only by a person present at the decanting process
- the container is subsequently rendered free from any hazardous chemical immediately after use, so the container is in the condition it would be in if it had never contained the chemical.

3.3.1 Examples

- A sample of hydrocarbon solvent is dispensed from a bulk container into a 15 L container by Worker A. All of the decanted hydrocarbon solvent in the 15 L container is then used immediately by Worker A in the same shift. No hydrocarbon solvent is left in the 15 L container (as though it has never contained the chemical). The container with the dispensed solvent is not left unattended by Worker A before it is used.

  In this example, the decanted hydrocarbon solvent is considered to be used immediately.

- A sample of hydrocarbon solvent is dispensed from a bulk container into a 15 L container by Worker A. The solvent in the 15 L container is not completely used up by Worker A at the end of his/her work shift. Worker A has not left the container with the dispensed solvent unattended during the shift. The remainder of the solvent is left for Worker B.

  In this example, the decanted hydrocarbon solvent is not considered to be used immediately.

Where a container is repeatedly used for decanting as part of normal work procedures or processes, a permanent label with all the general labelling information must be attached to the container. Permanently labelled containers must not be used to contain any other substances or mixtures than those specified on the label.

3.4 Hazardous chemicals with known hazards that are not supplied to another workplace

If a hazardous chemical is not being supplied to another workplace (including a coal mine) and the hazards associated with the chemical are known to the workers involved in using, handling or

storing the chemical, then the label must, at a minimum, be written in English and include the following:

- the product identifier, and
- a hazard pictogram or hazard statement that are consistent with the correct classification of the chemical.

Where a hazardous chemical will not be supplied to another workplace (including a coal mine), and your workers involved in its handling have sufficient knowledge of the associated hazards, then you may omit some of the information normally required in a label. The label should communicate enough information on the hazards as necessary to ensure its safe use.Examples of labelling chemicals that are not supplied to another workplace

- Hazardous Chemical A is manufactured at Site A. Batch samples of Hazardous Chemical A are routinely sent to a laboratory at the same manufacturing site for analysis. Samples of Hazardous Chemical A are handled on a regular basis at the on-site laboratory, and the hazards are well-known by the workers. Reduced labelling is permitted for the batch samples.
- Active Constituent A is manufactured at Site A and then later formulated into an end-use product, Agricultural Chemical Product A. The end-use product is formulated at the same facility, Site A, where the active ingredient is manufactured, and the workers undertaking the formulation step are aware of the hazards. In this case, the reduced labelling is permitted for Active Constituent A. However, Agricultural Chemical Product A must be labelled with all requisite labelling information.
- From the previous example, if Active Constituent A is transported to a different facility, Site B, for formulation into the end-use product Agricultural Chemical Product A, even where both facilities are owned and operated by the same company, Active Constituent A must be labelled with all requisite labelling information.

3.5 Hazardous waste products

Hazardous waste products must be identified and correctly classified. Where it is not reasonably practicable to undertake a complete hazard classification of waste material, the hazard classification must be determined or estimated using a precautionary approach based on the known or likely constituents of the waste.

If it is reasonably likely that a waste product is a hazardous chemical, then the label on the container of the hazardous waste must be written in English and at a minimum, include the following:

- the product identifier
- the name, Australian address and business telephone number of either the manufacturer or the importer, and
- a hazard pictogram and hazard statement that are consistent with the correct classification of the chemical.

The product identifier should reflect the nature of the waste as closely as possible and may depend on the extent of knowledge about the components of the waste. Examples of product identifiers may include:

- chlorinated solvent waste
- flammable waste
- chromium VI waste
- heavy metal waste.

Labels for hazardous wastes should include as much hazard information as reasonably practicable based on what is known about the identity and any suspected hazards. The label of any hazardous wastes should also include, where possible, the following information:

- the identity of any known or likely hazardous constituents or impurities and their proportions (for example, ‘contains chromium VI, 5%’, or ‘may contain trace levels of organic peroxides’)
- relevant precautionary statements
- relevant first aid and safety directions
- any other information that may assist identification of the hazardous waste and its associated hazards.

If you have made every reasonable attempt to identify and classify the chemical waste and have been unsuccessful, you should clearly indicate this on the label.

3.6 Hazardous chemicals classified in the explosives hazard class

If a hazardous chemical may be classified in the explosives hazard class and is not an explosive article, the chemical must be packed in a container that has a label in English that complies with the Australian Code for the Transport of Explosives by Road and Rail and includes the following:

- the proper shipping name and UN number of the chemical, and
- any hazard pictogram, any hazard statement and any precautionary statement that are consistent with the correct classification of the chemical in relation to health hazards.

The *Australian Code for the Transport of Explosives by Road and Rail* (Explosives Code) outlines requirements for labelling of explosives hazard class. This labelling regime is designed primarily for the communication of physical hazards of explosives during their transport.

Hazardous chemicals in the explosives class that meet the criteria for health hazards may require health and safety information on labels in addition to that required by the Explosives Code to meet workplace requirements.

Information on health hazards is not required on labels of explosive articles. Explosive articles should be labelled in accordance with the Explosives Code. However, where exposure to substances and mixtures within an article could occur during handling, any relevant health information should be included on labels.

3.7 Hazardous chemicals that are dangerous goods packaged for transport

Where a hazardous chemical has been packaged and labelled in accordance with dangerous goods transport requirements and is in-transit, the hazardous chemical is not subject to workplace labelling requirements. Where workplace hazardous chemicals are not in-transit, they must be labelled with all of the required labelling information. An example of in-transit on a mine includes receipting an IBC of chemical at the main warehouse prior to dispatch to the end user on the mine.

Hazardous chemicals that are classified as dangerous goods and transported by road or rail must comply with the labelling or marking requirements that are specified in the ADG Code. Transport markings and class labels of the ADG Code are designed primarily to assist emergency services personnel in case of an accident or emergency.

Note: The ADG Code refers to dangerous goods pictograms as Class or Division labels. Other information required on a package or container is referred to as markings. The size and colour of labels and markings required for transport are specified in the ADG Code.

The ADG Code recognises the GHS as an appropriate labelling system for inner packages of dangerous goods during transport. As this code describes GHS-compliant labelling, labels prepared in accordance with this code should meet the inner package labelling requirements prescribed in the ADG Code for dangerous goods during transport.

To meet both workplace and transport labelling requirements, additional health and safety information may be required on some transport containers. The additional information would generally relate to chronic health hazards, which are not regulated for transport purposes.

For outer packaging used within the workplace, workplace labelling requirements may be met by attaching to the container a supplementary panel or label that includes the additional information. The additional information should be clearly distinguishable from the information required to meet transport laws.

3.8 Consumer products

A hazardous chemical does not need to meet the labelling requirements under the CMSHR if the chemical is a consumer product with the original label on its container and if it is reasonably foreseeable that the hazardous chemical will be used in the workplace only:

- in a quantity that is consistent with consumer household use
- in a way that is consistent with consumer household use, and
- in a way that is incidental to the nature of the work carried out by a worker using the chemical.

The following example shows how to distinguish between a consumer product and a workplace hazardous chemical:

Toilet cleaner is sold in 750 ml bottles for domestic use and is sold in 20 L containers to commercial cleaning businesses. The 750 ml bottle is intended for domestic use and does not need to be labelled in accordance with workplace labelling requirements.

However, it is reasonably foreseeable that, due to the package size of the 20 L product, it would be used in a workplace rather than in a domestic situation. Therefore, the 20 L product must be labelled according to workplace labelling requirements.

Consumer products which do not meet the definition of a workplace hazardous chemical and are covered by the SUSMP must comply with SUSMP labelling requirements.

3.9 Agricultural or veterinary chemical products

Agricultural and veterinary chemicals must have a label in English that complies with the requirements of the Australian Pesticides and Veterinary Medicines Authority and also includes the following:

- any hazard statement that is consistent with the correct classification of the chemical, and
- any precautionary statement that is consistent with the correct classification of the chemical.

Agricultural or veterinary chemical refers to any agricultural chemical product or veterinary chemical product as defined in the Commonwealth's *Agricultural and Veterinary Chemicals Code Act 1994.*

The Australian Pesticides and Veterinary Medicines Authority (APVMA) labelling codes for agricultural and veterinary chemical products are the *Ag Labelling Code* and the *Veterinary Labelling Code*, respectively. You may omit the hazard pictogram and signal word from the labels of these chemicals. However, the label must contain hazard statements and precautionary statements for all of the intrinsic hazards of the product.

Note: Hazard and precautionary statements required for some intrinsic hazards under the CMSHR may not be required on labels by APVMA legislation. As the manufacturer or importer, you must ensure that any additional hazard and precautionary statements required by the CMSHR are included on the label, provided they are not contrary to the information required by the APVMA legislation.

3.10 Products containing nanomaterials

For engineered or manufactured nanomaterials[3] or chemicals containing engineered or manufactured nanomaterials, it is recommended that labels be prepared in accordance with this Recognised Standard unless there is evidence that the nanomaterials are not hazardous.

The following label statements are recommended for products containing nanomaterials when the hazards are not fully characterised:

- Contains engineered/manufactured nanomaterials. Caution: Hazards unknown.
- Contains engineered/manufactured nanomaterials. Caution: Hazards not fully characterised.

These phrases are for use on an interim basis, as the manufacturer/importer has a duty to correctly classify the chemical and include information on known hazards on the label in accordance with the CMSHR.

[3] *ISO TS 80004-1:2010 Nanotechnologies- Vocabulary-Part 1: Core Terms* provides the following definitions:

- Nanomaterial – material with any external dimension in the nanoscale or having internal structure or surface structure in the nanoscale
- Engineered nanomaterial – nanomaterial designed for a specific purpose or function
- Manufactured nanomaterial – nanomaterial intentionally produced for commercial purposes to have specific properties or specific composition
- Nanoscale – size range from approximately 1nm to 100 nm.

4 Labelling design and layout

The label must be written in English.

The size of a label should be:

- large enough to contain all of the relevant hazard and other information in a size and style that is easily visible and legible in the workplace
- appropriate to the size of the container, with larger labels present on larger containers.

The information on a label may be presented using one or more panels, or sections, dependent on the size and shape of the container. The label should be firmly secured to the outside of the container and should be visible in the normal storage position. The label should be sufficiently durable so as to remain legible and firmly attached to the container for the foreseeable lifetime of the product under normal storage and handling conditions.

The information and hazard pictograms on any label should be printed in a colour or colours that provide a distinct contrast to the background colour.

4.1 Grouping information

A label should group specific information together so that hazard or precautionary information can be easily located.

4.2 Orientation and size of label elements

The text, hazard pictograms and other information on a label should be of a size and style that is easily legible and is appropriate to the size of the label and container.

The following table is provided as a guide for the minimum dimensions for hazard pictograms and sizes of text on containers of various capacities:

Container capacity	Minimum hazard pictogram dimensions	Minimum text size
≤ 500 mL	15 x 15 mm	2.5 mm
> 500 mL and ≤ 5 L	20 x 20 mm	3 mm
> 5 L and ≤ 25 L	50 x 50 mm	5 mm
≥ 25 L	100 x 100 mm	7 mm

Note 1: Refer to the ADG Code for marking requirements for dangerous goods being transported.

Examples of labels that have been produced in accordance with the labelling system described in this Recognised Standard are provided in Appendix 1-I.

5 Other obligations in relation to labelling

A person who has an obligation for managing risk under the CMSHA who manufactures hazardous chemicals at the workplace or decants or transfers a hazardous chemical from its original container, must ensure that the container is correctly labelled.

It must also be ensured that a container labelled for a hazardous chemical is used only for the use, handling or storage of that hazardous chemical.

These requirements do not apply if the hazardous chemical is used immediately after it is put into the container and the container is thoroughly cleaned immediately after use to the condition it would be in if it had never contained the material.

5.1 Containers found without correct labelling

If you find that a container of a hazardous chemical is not correctly labelled in accordance with the CMSHR, you should attach the product identifier to the container. You should not use a hazardous chemical that is not correctly labelled. Store it in isolation until it is appropriately labelled.

If the product identifier of an unlabelled chemical is not known, this should be clearly marked on the container, for example by attaching a label to the container with the statement:

Caution - Do Not Use - Unknown Substance.

You should take steps to either identify and correctly label the unknown chemical or dispose of the contents in accordance with relevant environmental regulations and, where necessary, in consultation with the relevant waste management authority.

5.2 Reviewing and updating information on labels

From time to time, the hazard classification of a hazardous chemical may change, for example where new information becomes available. Where the hazard classification of a hazardous chemical changes, the label must be reviewed and, if necessary, revised to reflect any required changes.

Importers, manufacturers and suppliers should review any new or significant information in relation to any hazardous chemicals they import, manufacture or supply. A review of the literature and other relevant sources of information should be undertaken on a regular basis.

It is good practice to review the label information of a hazardous chemical at the same time as the safety data sheet (SDS) is updated. SDSs are updated:

- when any new information about the hazardous chemical is known or received to ensure the SDS contains correct, current information
- at least once every five years.

If you have an obligation to label a workplace hazardous chemical, then you must ensure that the label contains correct information at the time it is affixed to the container of the hazardous chemical.

RS17

Recognised Standard for Hazardous Chemicals

Part 2 – Manifests and placarding of hazardous chemicals and dangerous goods

Coal Mining Safety and Health Act 1999

Scope and application of Part 2

This Recognised Standard applies to substances, mixtures and articles used, handled or stored at the mine or quarry and which are defined as a **hazardous chemical or dangerous goods** under the CMSHR.

This Recognised Standard provides practical guidance to obligation holders at coal mines as to what is required for placarding stores and manifest quantities for the management of risk of hazardous chemicals or dangerous goods.

6 Part 2—Introduction

This part of the Recognised Standard outlines the requirements for the emergency manifests for hazardous chemicals or dangerous goods and placarding requirements of hazardous chemical or dangerous goods stores. The principle purpose of an emergency manifest is to inform a relevant emergency authority (including a mine's own emergency response personnel) of the types, quantities and locations of stored hazardous chemicals. This information is vital in ensuring appropriate emergency actions are selected primarily to prevent loss of life or further injury to people.

Similarly the purpose of placarding stores of hazardous chemicals and dangerous goods is to provide the primary warning of the presence and type of stored chemicals along with appropriate emergency procedures.

6.1 The meaning of key terms and abbreviations

ADG Code means the *Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th edition,* approved by the Australian Transport Council. The ADG Code is accessible at the National Transport Commission website www.ntc.gov.au.

Dangerous Goods means any substance, mixture or article that is defined under the ADG Code as dangerous goods or goods too dangerous to be transported.

Hazardous chemical means any substance, mixture or article that satisfies the criteria for a hazard class in the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS) including a classification referred to in this Recognised Standard, but does not include a substance, mixture or article that satisfies the criteria solely for one of the following hazard classes:

- acute toxicity - oral - Category 5
- acute toxicity - dermal - Category 5
- acute toxicity - inhalation - Category 5
- skin corrosion/irritation - Category 3
- serious eye damage/eye irritation - Category 2B
- aspiration hazard - Category 2
- flammable gas - Category 2
- acute hazard to the aquatic environment – Category 1, 2 or 3
- chronic hazard to the aquatic environment - Category 1, 2, 3 or 4, or
- hazardous to the ozone layer.

  Further definitions are in Appendix 1-A.

6.2 What are the obligations in relation to classification of hazardous chemicals?

The CMSHA and CMSHR apply specific obligations to various persons in relation to the correct classification of mine hazardous chemicals. These obligations are summarised below.

Obligation holder	Responsibilities
Operator **(s41 CMSHA)**	A coal mine operator for a coal mine has the following obligations— (a) to ensure the risk to workers while at the operator's mine is at an acceptable level, including, for example, by— (i) providing a safe place of work and safe plant; and (ii) maintaining plant in a safe state
Site Senior Executive **(s35, s56C, s63 CMSHR)**	The site senior executive must ensure the risk to persons from any substance provided by the site senior executive for the performance of work by someone other than the site senior executive's workers is at an acceptable level. s56C(1) The site senior executive for a coal mine must ensure the following things are correctly marked or labelled – (a) a hazardous chemical used, handled, stored or produced at the mine; (b) dangerous goods used, handled, stored or produced at the mine; (c) any thing containing, or being used to transport, a hazardous chemical mentioned in paragraph (a) or dangerous goods mentioned in paragraph (b). (2) A hazardous chemical, dangerous goods, or a thing mentioned in subsection (1)(c) is correctly marked or labelled if a mark or label - a. warns persons of the presence of the chemicals or goods; and b. identifies the chemical or goods; and c. to the extent necessary for managing risk, provides basic information about using, handling, storing, producing or transporting the chemical or goods. The site senior executive must ensure the mine has a current rescue plan showing the mine's emergency facilities, including relevant services reticulation and communication arrangements. A coal mine's safety and health management system must provide for managing emergencies at the mine. The system must provide for the following— (a)identifying, by risk assessment, potential emergency situations; (b)minimising risks associated with potential emergency situations;

7 Manifest of hazardous materials

7.1 When must a manifest of hazardous chemicals or Dangerous Goods be prepared?

A person who has an obligation to manage the risk of chemicals must, if the quantity of a hazardous chemical or group of hazardous chemicals in Appendix 2-A used, handled or stored at the mine exceeds the manifest quantity for the Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals:

a. prepare a manifest of Appendix 2-A hazardous chemicals; and

b. amend the manifest as soon as practicable if:

   i. the type or quantity of Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals that must be listed in the manifest changes; or

   ii. there is a significant change in the information required to be recorded in the manifest.

The purpose of the manifest is to provide current, simple and accurate information to emergency services (either the mine's own emergency services or an external provider) to ensure correct decisions are made for firefighting or other emergency response that may be needed.

7.2 Manifest—general information

If the emergency plan as determined under section 35 of CMSHR determines that external providers are required as part of the emergency plan, the manifest of hazardous chemicals must include:

c. the name of the mine and company; and

d. the address of the mine; and

e. the date the manifest was last amended or, if it has not been amended, the date it was prepared

7.3 Manifest—bulk storage and containers

If a hazardous chemical is stored in a bulk or in a container then the manifest of hazardous chemicals must include:

a. the name of the chemical; and

b. the quantity of the chemical stored.

For each container storing the hazardous chemical, the manifest of hazardous chemicals must include:

a. the identification number or code of the container; and

b. the type and capacity of the container; and

c. for a fixed vertical tank used to store fire risk hazardous chemicals—the diameter of the tank.

7.4 Manifest—identification of hazardous chemical and dangerous goods

The manifest of hazardous chemicals must include:

a. for a hazardous chemical, other than a flammable liquid category 4, unstable explosive, organic peroxide type A or self-reactive substance type A:

iii. the proper shipping name as stated in Table 3.2.3 of the ADG Code for the chemical; and

iv. the UN number as stated in Table 3.2.3 of the ADG Code for the hazardous chemical; and

v. the class and division of the hazardous chemical as stated in Table 3.2.3 of the ADG Code; and

b. for a flammable liquid category 4:

vi. the product identifier; and

vii. the words 'combustible liquid'; and

c. for an unstable explosive, organic peroxide type A or self-reactive substance type A:

viii. the name of the hazardous chemical stated in the ADG Code, Appendix A; and

ix. the words 'goods too dangerous to be transported'.

7.5 Manifest—storage area for packaged hazardous chemicals and dangerous goods

If a storage area contains, or is likely to contain, a packaged hazardous chemical, or a hazardous chemical in an IBC; and is required under this Recognised Standard to have a placard and the hazardous chemicals are dangerous goods under the ADG Code, then the manifest of hazardous chemicals must include:

d. the identification number or code for the storage area; and

e. for hazardous chemicals with an assigned class specified in Table 3.2.3 of the ADG Code—the largest quantity of each class of hazardous chemicals likely to be kept in the storage area; and

f. for the specified hazardous chemicals that are likely to be kept in the storage area:

i. the proper shipping name of the hazardous chemical as specified in Table 3.2.3 of the ADG Code; and

ii. the class to which the hazardous chemical is assigned as specified in Table 3.2.3 of the ADG Code; and

iii. the largest quantity of the hazardous chemical likely to be kept in the storage area; and

g. for an unstable explosive, organic peroxide type A or self-reactive substance type A that is likely to be kept in the storage area:

i. the name of the hazardous chemical; and

ii. the words 'goods too dangerous to be transported'; and

iii. the largest quantity of the hazardous chemical likely to be kept in the storage area; and

h. for hazardous chemicals with an assigned class specified in Table 3.2.3 of the ADG Code—the class to which the hazardous chemical is assigned; and

i. for flammable liquids category 4—the words 'combustible liquid'.

For section 7.5 of this Recognised Standard, ***specified hazardous chemicals*** means any of the following:

a. flammable liquid category 1;

b. self-reactive substances type B;

c. substances which in contact with water emit flammable gas category 1;

d. pyrophoric liquids category 1;

e. pyrophoric solids category 1;

f. organic peroxides type B;

g. acute toxicity category 1;

h. oxidising solids category 1;

i. oxidising liquids category 1;

j. skin corrosion category 1A;

k. gases under pressure with acute toxicity categories 1, 2 or 3 or skin corrosion categories 1A, 1B or 1C.

7.6 Manifest—hazardous chemicals and dangerous goods being manufactured

For each area in which hazardous chemicals are manufactured, the manifest must include:

a. the identification number or code of the area; and

b. a description of the hazardous chemicals manufactured in the area; and

c. the average and largest quantity of each hazardous chemical likely to be manufactured in the area.

7.7 Manifest—plan of mine

The manifest of hazardous chemicals at a mine must include a scale plan of the mine that:

a. shows the location of:

   i. containers and other storage of hazardous chemicals in bulk; and

   ii. storage areas for packaged hazardous chemicals and IBCs; and

   iii. each area where hazardous chemicals are manufactured or generated; and

b. includes a description in words of the location of:

   i. the things referred to in paragraph (a); and

   ii. hazardous chemicals in transit; and

c. provides the identification number or code, and a legend for the identification numbers and codes, for the things referred to in paragraph (a); and

d. shows the location of:

   i. the main entrance and other places of entry to and exit from the mine; and

   ii. essential site services, including fire services and isolation points for fuel and power; and

   iii. all drains on the site; and

   iv. the manifest; and

e. includes the direction of true north; and

f. describes the nature of the occupancy of adjoining sites or premises if applicable

8 Placarding requirements

8.1 Displaying placards

The site senior executive must ensure that a placard is prominently displayed at the workplace if the total quantity of an Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals stored at the workplace exceeds the placard quantity for the Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals.

However this does not apply to an Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals if the Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals is in bulk in a container, including an IBC, that is intended for transport and a placard is displayed on the container in accordance with the ADG Code.

The person must ensure that the placard is:

a. clearly legible by persons approaching the placard; and

b. separate from any other sign or writing that contradicts, qualifies or distracts attention from the placard; and

c. if a placard quantity of the hazardous chemical is contained in a building:

    i. located as close as is reasonably practicable to the main entrance of the building; and

    ii. located at the entrance to each room or walled section of the building in which the hazardous chemical is used, handled or stored; and

d. if the hazardous chemical is contained in a container or outside storage area—located next to the container or outside storage area; and

e. for a placard to which clause 8.3 applies—located at each entrance to the mine where an emergency service organisation may enter the mine; and

f. for a placard to which clause 8.4 applies—located on or next to each container or storage area in which the hazardous chemicals are stored; and

g. for a placard to which clause 8.6 applies—located at each entrance to a storage area in which the hazardous chemicals are stored.

8.2 Maintaining placards

A person who is required to display a placard must:

a. amend the placard as soon as practicable if:

    i. the type or quantity of hazardous chemical used, handled or stored at the mine changes; and

    ii. the change requires the information displayed on the placard to be amended; and

b. ensure that the placard is:

    i. kept clean; and

    ii. maintained in good repair; and

    iii. not covered or obscured.

8.3 Outer warning placards

The site senior executive must ensure that an outer warning placard is prominently displayed at the workplace if the total quantity of an Appendix 2-A hazardous chemical or group of Appendix 2-A

hazardous chemicals used, handled or stored at the workplace exceeds the placard quantity for the Appendix 2-A hazardous chemical or group of Appendix 2-A hazardous chemicals.

The outer warning placard must:

a. comply with the form shown in figure 1; and

b. display the word 'HAZCHEM' in red letters on a white or silver background.

Figure 1 Form and dimensions of outer warning placard

In this clause, ***red*** means the colour 'signal red' in accordance with AS 2007S–1996 (R13) (Colour standards for general purposes—signal red).

8.4 Placards for particular hazardous chemicals and Dangerous Goods stored in bulk

This section applies if a mine must display a placard at the mine in relation to the storage in bulk of any of the following hazardous chemicals:

a. gases under pressure, including flammable gases and flammable aerosols;

b. flammable liquids category 1, 2 or 3;

c. flammable solids category 1 or 2, self-reactive substances types B to F, self-heating substances category 1 or 2 or substances that, in contact with water, emit flammable gases;

d. organic peroxides types B to F, oxidising solids and oxidising liquids category 1, 2 or 3;

e. acute toxicity category 1, 2 or 3;

f. skin corrosion category 1A, 1B or 1C and corrosive to metals category 1.

The placard must:

a. comply with the template in figure 2; and

b. subject to subclause (4)(b) and (c), have dimensions not less than those shown in figure .2.

The placard must include the following in figure 2 for the hazardous chemical (*see notes below):

a. in space (p)—the proper shipping name for the hazardous chemical as specified in Table 3.2.3 of the ADG Code;

b. in space (q)—the UN Number for the hazardous chemical as specified in Table 3.2.3 of the ADG Code;

c. in space (r)—the Hazchem Code for the hazardous chemical as specified in Table 3.2.3 of the ADG Code;

d. in space (s)—the class label and subsidiary risk label for the hazardous chemical as specified in Table 3.2.3 of the ADG Code (see Appendix 2-A for summary of class label pictograms against GHS classification).

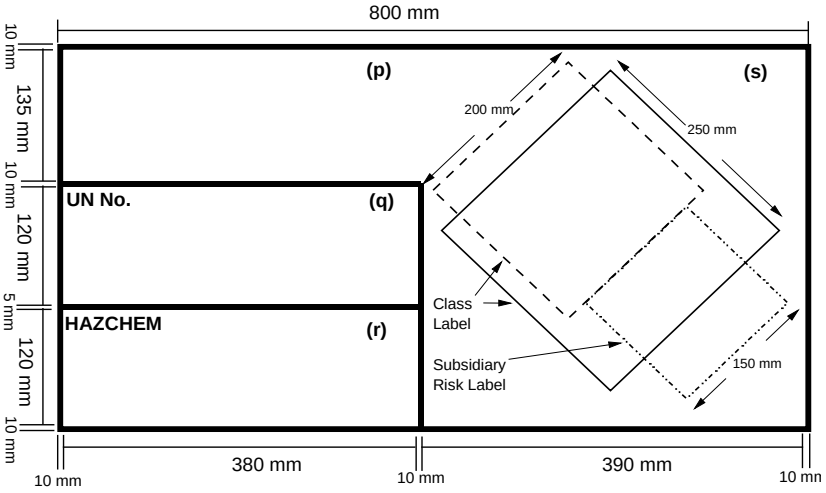

Figure 2 Template for a placard for a hazardous chemical stored in bulk

*Notes

For spaces (p), (q) and (r) in figure 2 the numerals and letters used for showing the proper shipping name, UN number and Hazchem Code must be:

a. black on a white background, unless a letter of the Hazchem Code is white on a black background; and

b. if the proper shipping name requires a single line only—at least 100mm high; and

c. if the proper shipping name requires 2 lines—at least 50mm high.

For space (s) in figure 2:

a. the class label and subsidiary risk label (if any) must have the form and colouring stated in the ADG Code for the hazardous chemical; and

b. the class label must have:

i. if there is a subsidiary risk label—sides not less than 200mm; or

ii. in any other case—sides of not less than 250mm; and

c. if there is a subsidiary risk label—the subsidiary risk label must have sides of not less than 150mm; and

d. if there are 2 or more subsidiary risk labels—the width of the right hand part of the placard may be extended.

8.5 Placards for unstable explosives, organic peroxides type A or self-reactive substances type A stored in bulk

This section applies if a mine must display a placard at the mine in relation to unstable explosives, organic peroxides type A or self-reactive substances type A that are stored in bulk.

The placard must:

a. comply with the form in figure 2; and

b. have dimensions not less than those shown in figure 2.

The placard must include the following, as indicated in figure 2, for the hazardous chemical:

a. in space (p)—the name stated in the ADG Code for the hazardous chemical;

b. in space (q)—the space left blank;

c. in space (r)—the space left blank;

d. in space (s)—the label in figure 3.

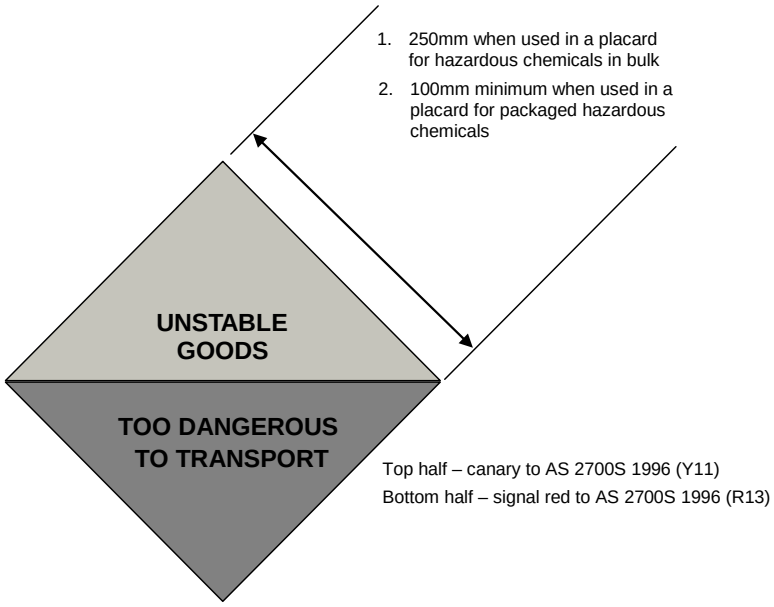

Figure 3 Label for unstable explosive, organic peroxide type A or self-reactive substance type A

For space (p) in figure 2, the letters used for showing the name must be:

a. black on a white background; and

b. if the name requires a single line only—at least 100mm high; and

c. if the name requires 2 lines—at least 50mm high.

For space (s), the label in figure 3 must have sides of not less than 250mm.

8.6 Placards for packaged Appendix 2-A hazardous chemicals (other than flammable liquids category 4) and IBCs

This clause applies if a person at a mine must display a placard at the mine in relation to the storage of:

a. packaged Appendix 2-A hazardous chemicals (other than flammable liquids category 4); or

b. an Appendix 2-A hazardous chemical in an IBC.

The placard must:

a. be in the form shown in figure 4; and

b. be of sufficient size to accommodate the labels to be included on the placard; and

c. have a white or silver background; and

d. include each required class label:

i. in the form and colouring stated in the ADG Code for the hazardous chemical; and

ii. with sides not less than 100mm.

The placard must include the following:

a. for an Appendix 2-A hazardous chemical (other than unstable explosive, organic peroxide type A, self-reactive substance type A) present in a storage area at the mine—the class label as stated in the ADG Code for each category of hazardous chemicals present in at least the placard quantity; or

b. for a flammable liquid category 4 stored with flammable liquids in a storage area at the mine—a class 3 class label as stated in the ADG Code; or

c. for an unstable explosive, organic peroxide type A or self-reactive substance type A—the label in figure 3.

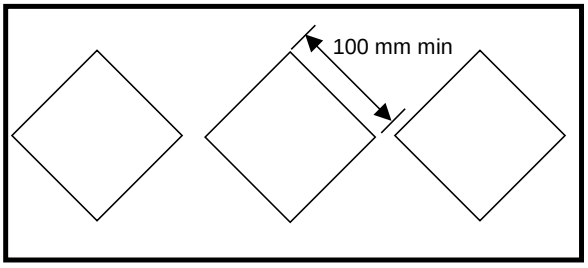

Figure 4 General form of placard for packaged Appendix 2-A hazardous chemicals

If hazardous chemicals in an IBC at the mine are Appendix 2-A hazardous chemicals intended for transport, and not intended for use at the mine:

a. the IBC must display a placard in accordance with the ADG Code; and

b. the storage area at the mine must display a placard in accordance with this clause.

8.7 Placards for flammable liquids category 4 packaged or in bulk

This clause applies if a person at a mine must display a placard at the mine in relation to the storage of:

a. a packaged flammable liquid category 4; or

b. a flammable liquid category 4 in bulk.

The placard must:

a. be in the form shown in figure 5; and

b. have dimensions not less than those shown in Figure 5; and

c. have black letters on a white or silver background.

Figure 5 Placard for flammable liquid category 4

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Recognised Standard for Hazardous Chemicals

Part 3 – Preparation of safety data sheets for hazardous chemicals

Coal Mining Safety and Health Act 1999

Scope and application of Part 3

This Recognised Standard applies to substances, mixtures and articles used, handled, stored or produced at a coal mine and which are defined as hazardous chemicals or under the CMSHR.

This part of the Recognised Standard provides practical guidance on how to prepare a safety data sheet for any hazardous chemicals that are being manufactured or imported for use, handling or storage at a coal mine. It applies to a person involved in the manufacture or import of hazardous chemicals that will be used, or could reasonably be expected to be used, at a coal mine, and to site senior executives and others with safety and health obligations.

9 Part 3—Introduction

9.1 What is a safety data sheet?

A safety data sheet (SDS), previously called a Material Safety Data Sheet (MSDS), is a document that provides information on the properties of hazardous chemicals, how they affect health and safety in the workplace and on how to manage the hazardous chemicals in the workplace. For example it includes information on the identity, health and physico-chemical hazards, safe handling and storage, emergency procedures and disposal considerations.

An SDS is an important tool for eliminating or minimising the risks associated with the use of hazardous chemicals in workplaces, including coal mines.

9.2 The meaning of key terms and abbreviations

ADG Code means the Australian Code for the Transport of Dangerous Goods by Road and Rail, 7th edition, approved by the Australian Transport Council. The *ADG Code* is accessible at the National Transport Commission website www.ntc.gov.au

Hazardous chemical means any substance, mixture or article that satisfies the criteria for a hazard class in the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS) including a classification referred to in this Recognised Standard, but does not include a substance, mixture or article that satisfies the criteria **solely** for one of the following hazard classes:

- acute toxicity - oral - Category 5
- acute toxicity - dermal - Category 5
- acute toxicity - inhalation - Category 5
- skin corrosion/irritation - Category 3
- serious eye damage/eye irritation - Category 2B
- aspiration hazard - Category 2
- flammable gas - Category 2
- acute hazard to the aquatic environment – Category 1, 2 or 3
- chronic hazard to the aquatic environment - Categories 1, 2, 3 or 4, or
- hazardous to the ozone layer.

Further definitions and abbreviations used in this Recognised Standard are listed in Appendix 1-A.

9.3 What are the obligations in relation to the preparation of safety data sheets?

Manufacturers, importers and suppliers of hazardous chemicals have obligations under the CMSHA and CMSHR to provide current information about the hazardous chemical in the form of an SDS. Site senior executives also have an obligation to ensure that SDSs are obtained and available for all workers. These obligations are summarised below.

Duty holder	Responsibilities
Manufacturer, importer and a of a hazardous chemical (s46 CMSHA)	to ensure appropriate information about the safe use, storage and disposal of the substance is provided with the substance
Sire Senior Executive (s56A CMSHR)	(1) The site senior executive for a coal mine must ensure the following things are recorded in a register at the mine— (a) a hazardous chemical used, handled, stored or produced at the mine; (b) dangerous goods used, handled, stored or produced at the mine; (c) the current safety data sheet for a hazardous chemical mentioned in paragraph (a) or dangerous goods mentioned in paragraph (b).

Note: a person who packages or re-labels a hazardous chemical with their own product name is considered to be a manufacturer and therefore has the same obligations as a manufacturer or importer under the CMSHA to prepare an SDS.

Manufacturers and importers of a substance, mixture or article must, before first supplying it to a workplace, determine whether it is a hazardous chemical and, if so, to correctly classify that substance, mixture or article. The person writing the SDS should have appropriate expertise and have access to the product formulation and information on its correct hazard classification.

9.4 When is it necessary to prepare a safety data sheet?

A safety data sheet must be prepared before first manufacturing or importing a hazardous chemical, or if this is not possible, as soon as practicable after first manufacturing or importing the chemical.

Preparing and providing an SDS is mandatory where a substance, mixture or article is a hazardous chemical. However an SDS is not required to be prepared for any of the following chemicals (although the general obligations under the CMSHA still apply):

- chemicals in batteries while they are incorporated in plant
- fuel, oils or coolants in a container that is fitted to a vehicle, vessel or aircraft, mobile plant, appliance or other device, where the fuel, oils or coolants are intended for use in its operation
- fuel in the fuel container of a domestic or portable fuel burning appliance where the quantity of fuel does not exceed 25 kg or 25 litres
- hazardous chemicals in portable fire-fighting or medical equipment for use at a workplace
- hazardous chemicals that form part of the integrated refrigeration system of refrigerated freight containers
- potable liquids that are consumer products at retail premises.

The following things are excluded from the scope of the GHS classification except to the extent that the use, handling or storage of those things is related to a work activity at a workplace including a coal mine:

- food and beverages within the meaning of the *Food Standards Australia New Zealand Food Standards Code* that are in a package and form intended for human consumption
- therapeutic goods at the point of intentional intake by or administration to humans
- veterinary chemical products at the point of administration to animals
- tobacco or products made of tobacco.

While this Recognised Standard applies to hazardous chemicals as defined, an SDS should be provided for any chemical that may adversely impact the health or safety of persons or the environment, but has insufficient information to allow it to be correctly classified. The SDS should reflect what is currently known about the chemical.

Where a mixture contains an ingredient that meets the criteria for respiratory and skin sensitisation, specific target organ toxicity, reproductive toxicity, carcinogenicity and mutagenicity it is recommended that an SDS be prepared for that mixture, even if the mixture overall is not a hazardous chemical according to the GHS classification.

Other information on hazard properties of a chemical not already captured within the SDS should be included, for example if the chemical has ototoxic properties.[4]

Some overseas authorities may require an SDS or information on an SDS for certain chemicals that are not hazardous chemicals under the CMSHR, for example substances that meet the criteria for a GHS hazard class or category as noted in this section.

- Products containing nanomaterials
- For engineered or manufactured nanomaterials[5] or chemicals containing engineered or manufactured nanomaterials, an SDS should be provided unless there is evidence that the nanomaterials are not hazardous.

[4] Ototoxicity is the potential damage to the ears, specifically to the cochlea or auditory nerve, by a toxin. A list of ototoxic substances is included in Appendix A of the Code of Practice: *Managing Noise and Preventing Hearing Loss at Work*.

[5] ISO TS 80004-1:2010 Nanotechnologies- Vocabulary-Part 1: Core Terms provides the following definitions:

- Nanomaterial – material with any external dimension in the nanoscale or having internal structure or surface structure in the nanoscale
- Engineered nanomaterial – nanomaterial designed for a specific purpose or function
- Manufactured nanomaterial – intentionally produced for commercial purposes to have specific properties or specific composition
- Nanoscale – size range from approximately 1 nm to 100 nm.

10 Preparing, reviewing and amending safety data sheets

An SDS must be prepared and written to provide accurate information about the hazards of a chemical and how to handle it safely, including its storage and disposal. It must contain information about physico-chemical properties, as well as potential health and emergency response measures. The SDS should also contain information relevant to environmental effects to meet other laws.

10.1 What information is needed in an SDS?

A safety data sheet must:

- be in English
- contain unit measures expressed in Australian legal units of measurement under the *National Measurement Act 1960* (Commonwealth)
- state the date it was last reviewed, or if it has not been reviewed, the date it was prepared
- state the name, Australian address and business telephone number of the manufacturer or the importer
- state an Australian business telephone number from which information about the chemical can be obtained in an emergency.

The language used in an SDS should be simple, clear and precise, avoiding jargon, acronyms and abbreviations. Vague and misleading expressions should not be used. Phrases such as “may be dangerous”, “no health effects”, “safe under most conditions of use” and “harmless” are also not recommended. It may be that information on certain properties is of no significance or that it is technically impossible to provide detailed information, and if so, the reasons for this should be clearly stated under each heading. If it is stated that a particular hazard does not exist, the safety data sheet should clearly differentiate between cases where no information is available to the classifier and cases where negative test results are available.

Other units of measurement, including the International System of Units (SI) or non-SI units may be used if they are in wide use in Australia. For example, mm Hg for vapour pressure or degrees Celsius (°C) rather than Kelvin (K) for temperature can be used.

An SDS should include a version number, superseded date or some other indication of what version is replaced.

There is no limit in relation to the length of the document, but it should be proportionate to the hazard level of the chemical and the available information.

All pages of an SDS should be numbered and include an indication of the end of the SDS, for example, “Page 1 of 3”. Alternatively, number each page and indicate whether there is a page following, for example, “Continued on next page” or “End of SDS”.

A safety data sheet for a hazardous chemical must state the following information about the chemical:

Section 1 - Identification: Product identifier and chemical identity

Section 2 – Hazard(s) identification

Section 3 - Composition and information on ingredients

Section 4 - First-aid measures

Section 5 - Fire-fighting measures

Section 6 - Accidental release measures

Section 7 - Handling and storage, including how the chemical may be safely used

Section 8 - Exposure controls and personal protection

Section 9 - Physical and chemical properties

Section 10 - Stability and reactivity

Section 11 - Toxicological information

Section 12 - Ecological information

Section 13 - Disposal considerations

Section 14 - Transport information

Section 15 - Regulatory information

Section 16 - Any other relevant information

10.2 of this Recognised Standard contains further guidance about the information that should be included in the SDS, where relevant and available.[6] A reasonable attempt should be made to obtain the information, however, when information is not available or lacking, this should be clearly stated. The SDS should not contain any blank spaces or abbreviations without a legend.

Any recommendation made by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) in a relevant NICNAS assessment report relating to the information required in an SDS should be reviewed and considered for inclusion.

Information to protect the health and safety of persons in the workplace may be included on the SDS for chemicals that do not meet the *GHS* classification criteria, for example some miscellaneous dangerous goods (identified in the *ADG Code*). For example, the health and safety information for dry ice could include recommendations under *Section 7 – Handling and Storage* to use gloves while handling the hazardous chemical, instructions not to use it in enclosed spaces and to ensure that there is adequate ventilation.

[6] 'Available' means where the information is available to the manufacturer or importer.

10.2 Research chemicals, waste products or samples for analysis

Where it is not reasonably practicable to comply with the CMSHR to prepare an SDS for a chemical that is a research chemical, waste product or a sample for analysis because the hazard properties are not fully known, then an acceptable SDS is one that:

- is written in English
- states the name, Australian address and business telephone number of the manufacturer or importer
- states that full identification or hazard information is not available for the chemical, and in the absence of such information a precautionary approach must be taken to handling or storing the chemical
- states the chemical identity or structure of the chemical, or chemical composition, as far as is reasonably practicable
- states any known or suspected hazards, and
- states any precautions that must be taken in using, handling or storing the chemical, to the extent such precautions have been identified.

It is acceptable to prepare a single SDS for a group of substances, mixtures and articles where it is reasonable to assume that the group will have similar hazardous properties, provided the SDS contains all product identifiers.

10.3 Can an SDS prepared overseas be used?

An SDS prepared by an overseas manufacturer or supplier is acceptable only if it is prepared in accordance with the CMSHR. If the overseas manufacturer's SDS does not comply with the requirements of the CMSHR, the importer will be responsible for preparing an SDS that does comply.

An SDS prepared in accordance with national legislation of other countries implementing the GHS (for example, the EU CLP-Regulations)[7] must be checked for compliance with the CMSHR and amended if necessary to bring it into compliance.

10.4 Reviewing and amending an SDS

The SDS must be reviewed every five years from the date of original preparation or the last revision of the SDS. It must be amended whenever any new information about the hazardous chemical is known or received or when the formulation changes.

It is not necessary to review the SDS if the manufacturer or importer has not manufactured or imported the chemical in the last five years.

An SDS should still be made available after the hazardous chemical is withdrawn from sale as it may be required by workplaces at a later date.

It is acceptable to have a translation of the SDS attached to the original SDS, provided the appended information clearly states the translation is not part of the original SDS. The original SDS is the SDS prepared in accordance with the CMSHR.

[7] CLP-Regulation (European Commission) No 1272/2008 came into force on 20 January 2009 and aligns existing European Union legislation to the United Nations Globally Harmonized System (GHS)

11 Content of the safety data sheet

This chapter describes the type of information needed for each of the sections required in an SDS. A summary of this information is provided in a checklist at Appendix 3-A.

11.1 Section 1 – Identification

This section provides information about the identification of the hazardous chemical, recommended uses and the contact details of the Australian manufacturer or importer, including an emergency contact.

Product identifier	The SDS must include the product identifier of the hazardous chemical, exactly as found on the label. If one generic SDS is used to cover several minor variants of a hazardous chemical, all product identifiers must be listed on the SDS.
Other means of identification	The hazardous chemical must be identified by its product identifier or its chemical name. The SDS must include any company product codes, numbers or other unique identifiers, for example a Proper Shipping Name (as identified in the *ADG Code*), or a name specified in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). Other names or synonyms by which the hazardous chemical is labelled or commonly known should also be provided in this section.
Recommended use of the chemical and restrictions on use	The recommended or intended use of the hazardous chemical should be provided in this section. This includes a brief description of what the chemical does, for example a flame retardant or anti-oxidant. Restrictions on use should be stated as far as known, for example if it is a prohibited carcinogen, an illicit drug precursor, or a chemical of security concern.
Details of manufacturer or importer	The name, full street address, phone number(s) and electronic address (where available) of the Australian manufacturer or importer must be included in the SDS.
Emergency phone number	The SDS must include Australian emergency contact information. The emergency information available through this service should be available outside of working hours. If an emergency information service or Poisons Information Centre phone number is provided in the SDS, this arrangement should be confirmed with the service beforehand and copies of the SDS should be provided to them.

11.2 Section 2 – Hazard(s) Identification

This section describes the hazards of the chemical and the appropriate warning information associated with the hazards as listed in Appendix 3-C. The information provided here must include a hazard classification statement explaining all the hazards of the hazardous chemical, as described below.

11.2.1 Classification of the hazardous chemical

If the hazardous chemical is classified in accordance with the *GHS*, the appropriate hazard class and category should be indicated, for example:

- Flammable liquid - Category 1
- Acute toxicity – oral – Category 3

Although it is not mandatory under this Recognised Standard, an SDS may provide information on environmental hazards and other *GHS* hazard classes and categories, for example Acute toxicity – oral – Category 5, that are outside the scope of this Recognised Standard.

11.2.2 Label elements, including precautionary statements

In this section the following labelling elements should be included in accordance with the hazardous chemicals classification, as listed in Appendix 3-C:

- Signal word
- Hazard statement(s)
- Precautionary statement(s)

Additionally**,** Appendix 3-C lists 12 non-*GHS* hazard statements that should be included on the SDS, where relevant.

It is not mandatory to include pictograms (or hazard symbols) in an SDS. However, these symbols may be included in this section as graphical reproductions in black and white. This allows for the distribution of an SDS with ease via hard copy or through a database.

Persons preparing an SDS can download the *GHS* pictograms from www.unece.org/trans/danger/publi/ghs/pictograms.html. Pictograms should meet the following size specification to avoid stretching or having oversized pictograms on the SDS:

- **>1x1 cm² and <2x2 cm**

The name of the pictogram should also be provided, which are defined in the tables in Appendix 3-C (for example, flame, skull and crossbones).

Dangerous goods class labels may also be used; however, graphical elements do not need be duplicated.

11.3 Section 3 – Composition and Information on Ingredients

The ingredient(s) of the hazardous chemical must be identified. This includes the identification of impurities and stabilising additives that contribute to the classification of the hazardous chemical.

11.3.1 Disclosure of ingredient names

The chemical identity of an ingredient must be disclosed on an SDS in accordance with Appendix 3-B of this Recognised Standard. In some cases, a generic name may be used.

Ingredients that are not classified as hazardous but have an exposure standard and which are present in the mixture/substance above 1% should be mentioned in the SDS if it is likely that they might be released under standard storage and application conditions.

Disclosure of ingredient names is not required for those ingredients that meet only physico-chemical and/or environmental hazard classifications, or for non-hazardous ingredients

There is no requirement to disclose the identity of ingredients for the following *GHS* health hazard categories because they fall outside the scope of this Recognised Standard:

- Acute toxicity – Category 5 (oral, dermal and inhalation)
- Skin corrosion/irritation – Category 3
- Serious eye damage/eye irritation – Category 2B
- Aspiration hazard – Category 2
- Aquatic toxicity (all categories)
- Flammable gas – Category 2
- Ozone depletion.

11.3.2 Use of generic names[8]

Generic names may be used in an SDS if the identity of an ingredient is genuinely commercially confidential, and if:

- the ingredient is in any of the following health hazard categories:
  - Acute toxicity - Category 4 (oral, dermal, inhalation)
  - Aspiration hazard - Category 1
  - Serious eye damage/eye irritation - Category 2A
  - Skin corrosion/irritation - Category 2
  - Specific target organ toxicity (single exposure) - Category 3;
- the ingredient does not cause the correct classification of the hazardous chemical to include any other hazard class or category; and
- an exposure standard for the ingredient has not been established.

A guide for selecting generic names for ingredients is included in Appendix 1-D.

11.3.3 Disclosure of proportions of ingredients

Where the chemical identity or generic name of an ingredient that makes up a hazardous chemical is disclosed, the proportions of the ingredients must also be disclosed in an SDS.

[8] This section is an Australian specific requirement not necessarily applicable in other countries. SDSs prepared for export products must comply with relevant legislation of the export country.

For multiple ingredients, proportions should be listed in descending order by mass or volume. Ingredients not contributing to the hazard classification should also be listed, and where included, should be listed after the ingredients contributing to the hazard classification.

However, where the exact concentration of an ingredient is commercially confidential, the concentration of the ingredient can be disclosed using the following ranges:

- <10%
- 10- <30%
- 30 – 60%
- >60%

The proportion of an ingredient should normally be disclosed using a narrower range, for example, for an ingredient present at 35%, a range of 30 - 40% should be used instead of 30 - 60%.

Where possible, the percentage composition should add up to or indicate a total of 100%, even if an estimate of non-hazardous ingredients needs to be provided.

11.4 Section 4 – First Aid measures

This section of the SDS provides information about the initial care that does not involve the use of sophisticated equipment or access to a wide selection of medications to be given to a person affected by a hazardous chemical. It should state whether medical attention is required for a chemical, including the urgency of treatment required.

A SDS should provide information on any immediate effects of the chemical, by route of exposure, and the immediate treatment required. It should also include information on the possible delayed effects of the chemical and on specific health surveillance that may be needed.

Description of necessary first aid measures	In this section, the SDS should provide first aid instructions for each relevant route of exposure and describe expected immediate and delayed symptoms. Sub-headings to indicate the procedure for each route (for example, inhalation, skin contact, eye contact and ingestion) should be used. Information should be provided on situations when: • immediate medical attention is required • known antidotes should be available for administration by persons trained in their use (and, where relevant, authorised by law) as part of the recommended first aid procedure • delayed effects can be expected after exposure • movement of the exposed individual to fresh air is recommended • removal of clothing and shoes from the individual is recommended • personal protective equipment (PPE) for first aiders is recommended • there is a risk that first aiders may be exposed to risks from individuals who have ingested hazardous chemicals (for example, organophosphates). Any information on specific first aid facilities, for example showers or eyewashes that are necessary in a workplace where the particular hazardous chemical is used, should also be provided.
Symptoms caused by exposure	Relevant information on the most important symptoms and effects of exposure to the chemical should be provided. Information should be provided on acute, delayed and aggravated medical conditions caused by the hazardous chemical to enable first aid to be administered.
Medical attention and special treatment	If applicable, information on clinical testing and medical monitoring for delayed effects, specific details on antidotes (where they are known) and contraindications are recommended for inclusion in this section.

11.5 Section 5 – Fire fighting measures

This section of the SDS provides information on how to fight a fire caused by a hazardous chemical, or a fire arising in its vicinity.

Suitable extinguishing equipment	This SDS should describe: • the type of extinguishers or fire fighting agents needed for extinguishing a fire • whether any extinguishers are unsuitable for a particular situation involving the hazardous chemical.
Specific hazards arising from the chemical	The SDS should describe any specific hazards that may arise from a hazardous chemical relevant to its physical properties, for example explosive properties or hazardous combustion products that may be generated when the hazardous chemical burns, for example: • "May produce toxic fumes, e.g. carbon monoxide if burning" • "Produces oxides of sulphur and nitrogen on combustion" • "May create flammable gas when wetted"
Special protective equipment and precautions for fire fighters	Advice should be provided on any precautions to be taken during fire fighting, for example, "Keep containers cool with water spray" and advice on appropriate PPE required for fire-fighters for example specific boots, overalls, gloves, eye and face protection, and breathing apparatus. The *Hazchem Code* must be included in this section for the information of emergency services. The *Hazchem Code* for bulk dangerous goods provides information on the fire-fighting medium to be used, for example whether water should be used as a fire-fighting agent, as this will be the first response of fire-fighters. The *Hazchem Code* includes information on PPE, the risk of violent reaction or explosion, spillage action and whether evacuation should be considered in the event of an incident with the material.

11.6 Section 6 – Accidental release measures

This section of the SDS provides information on the appropriate ways to respond to the release of chemicals, in the form of spills, leaks or other accidental release. This is so that the adverse effects on people, property and the environment at or near the workplace can be prevented or minimised. This information should distinguish between responses for large and small spills where the spill volume has a significant impact on the hazard or response.

Personal precautions, protective equipment and emergency procedures	The SDS should provide the following advice on a spill or release of a hazardous chemical: • The use of suitable equipment (including PPE) to prevent contamination of skin, eyes and personal clothing. • The removal of ignition sources and provision of sufficient ventilation. • Emergency procedures, for example the need to evacuate the danger area or to consult an expert.
Environmental precautions	Contamination of the environment can give rise to indirect human chemical exposures within and outside the workplace. The SDS should provide advice on precautions related to accidental spills and releases of the hazardous chemical into the environment, for example keeping away from drains and surface and ground water.
Methods and materials for containment and cleaning up	The SDS should include advice on how to contain and clean up a spill. Appropriate containment techniques may include: • Bunding[9]. • Covering of drains. • Capping procedures (providing a cover or protection, for example to prevent damage or spillage). Appropriate clean up procedures may include: • Neutralisation techniques. • Decontamination techniques. • Adsorbent materials. • Cleaning techniques. • Vacuuming techniques. • Equipment required for containment/clean up (includes the use of non-sparking tools and equipment where applicable). Recommended clean up procedures should also take into account disposal considerations under Section 13 – *Disposal considerations* of the SDS.

[9] A **bund** is a provision of liquid collection facilities which, in the event of any leak or spillage from tanks or pipe work, will capture well in excess of the volume of liquids held, for example, an embankment. Bunded areas should drain to a capture tank which should have facilities for water/oil separation.

11.7 Section 7 – Handling and storage

This section of the SDS provides guidance on safe handling and storage practices to minimise the risks of release and exposure to the hazardous chemical. These precautions should be appropriate to the intended use of the chemical and its unique properties.

11.7.1 Precautions for safe handling

Information should be provided to:

- allow for the safe handling of the hazardous chemical, for example, avoiding spills
- prevent inappropriate handling of incompatible hazardous chemicals
- minimise the release of the hazardous chemical outside of the workplace.

Information on how the chemical may be safely used must be provided.

General warnings on what practices to avoid or restrict should also be included in this section. This information is in addition to other hazard control measures in Section 8 – *Exposure controls and personal protection.* This section should also provide advice on general hygiene requirements, for example:

- “Eating, drinking and smoking in work areas is prohibited”
- “Wash hands after use”
- “Remove contaminated clothing and protective equipment before entering eating areas”.

11.7.2 Conditions for safe storage, including any incompatibilities

This section should include advice consistent with the physical and chemical properties of a hazardous chemical referred to in Section 9 - *Physical and chemical properties* and Section 10 – *Stability and Reactivity*. Advice should be provided on specific storage requirements, including:

- how to avoid:
    - explosive atmospheres
    - corrosive conditions
    - flammability hazards
    - incompatible substances or mixtures
    - evaporative conditions
    - potential ignition sources (including electrical equipment).
- how to control the effects of:
    - weather conditions
    - ambient pressure
    - temperature
    - sunlight
    - humidity
    - vibration.
- how to maintain the integrity of the hazardous chemical by the use of:
    - stabilisers

- anti-oxidants
- temperature control

- other advice on:
  - ventilation requirements for storage facilities
  - specific designs for storage rooms/vessels
  - quantity limits under storage conditions
  - packaging compatibilities
  - warnings if water should not be used as a fire-fighting agent, for example: “Ensure that fire-fighting water cannot reach water-sensitive chemicals and if necessary provide protective cabinets with appropriate labelling”.

11.8 Section 8 – Exposure controls and personal protection

This section provides guidance on how to eliminate or minimise risks associated with exposure to hazardous chemicals. “Exposure control” means the full range of specific protection measures (including engineering control measures) to be taken during the use of a hazardous chemical in order to minimise personal exposure to the chemical.

11.8.1 Exposure control measures

The SDS should include advice on what measures should be taken to minimise exposure to hazardous chemicals and to keep exposure below the relevant exposure standard. Exposure standards represent airborne concentrations of individual substances which, according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers.

Exposure standards are generally expressed as a Time-Weighted Average (TWA) concentration of a substance over an eight-hour working shift. Along with this, Short Term Exposure Limits (STEL) or Peak Limitations should also be specified where available.

This section should list the available exposure standards, including all notations, for each hazardous chemical ingredient. If additional air contaminants are generated when using the hazardous chemical as intended, exposure standards for these should also be listed.

If there are no Australian exposure standards or occupational exposure limits, overseas standards should be used. Examples of overseas standards or limits include those of the Health and Safety Executive (HSE) in Great Britain, American Conference of Governmental Industrial Hygienists (ACGIH) or the German MAK.

Regardless of the exposure standard (if any) this section should describe controls to be implemented in a workplace to eliminate or minimise personal exposure.

Exposure standards are reviewed from time to time and therefore an up-to-date record of exposure standards should be consulted. Exposure standards published by Safe Work Australia are the *Workplace Exposure Standards for Airborne Contaminants*. A list of Australian exposure standards is also available on the Hazardous Substances Information System (HSIS), which can be accessed from www.safeworkaustralia.gov.au.

11.8.2 Biological monitoring

Biological monitoring can assist in the detection and estimation of absorption of the hazardous chemical, for example by skin, gastrointestinal system, or inhalation. The effects of some hazardous chemicals used in the workplace must be monitored through biological monitoring. The SDS should detail the monitoring needed for a hazardous chemical.

It should also list known or recognised safe biological levels (in some countries these are known as biological limit values, biological exposure indices, biological exposure standards), where available, including notations for a hazardous chemical or for each ingredient of a mixture.

The source of the biological levels should be stated on the SDS. When biological levels are listed, they should use the chemical identity as specified in Section 3.3 – *Composition and information on ingredients*.

11.8.3 Control banding

Control banding is a process used in some countries where a hazardous chemical is assigned to a band, based on the chemical's hazard classification and use. Each band may have a different control solution, for example: band 1 – good industrial hygiene practice, band 2 – use local exhaust ventilation, band 3 – enclose the process.

If the control banding approach is recommended in the SDS to provide protection in relation to specific uses of the hazardous chemical, then sufficient detail should be given to enable effective management of risks. The context and limitations of the specific control banding recommendation should be made clear.

11.8.4 Engineering controls

The SDS should include a description of appropriate engineering control measures relating to the intended use of the hazardous chemical. This section should indicate when special engineering controls are necessary, and specify which controls are required, for example:

- "Maintain air concentration below occupational exposure standards, using engineering controls if necessary"
- "Use only in a well-ventilated area"
- "Use local exhaust ventilation"
- "Use only in an enclosed system"
- "Use only in spray paint booth or enclosure"
- "Use mechanical handling to reduce human contact with materials"
- "Use explosive dust handling controls".

The information in this section should complement that provided in Section 7 – *Handling and Storage of the SDS.*

11.8.5 Individual protection measures, for example personal protective equipment (PPE)

Consistent with the hierarchy of controls, PPE should be used only when other control measures (for example, elimination, substitution, isolation, engineering controls) have been found to be impracticable or in conjunction with one or more control measures. This section of the SDS should include information on PPE provided that it clearly recommends other controls to minimise exposure to the hazardous chemical.

Consideration should be given to the possible reduction in effectiveness of PPE and possible detrimental effects of hazardous chemicals on some materials from which items of PPE may be made, for example the use of synthetic clothing for protection against corrosive hazardous chemicals.

11.8.6 Eye and face protection

Information should be provided on eye and face protection needed for a hazardous chemical. It is important to specify:

- the type of eye protection required, for example safety glasses, goggles or face shields
- the properties of the eye protection required based on the hazard of the chemical and potential for contact, for example the degree of impact protection or splash resistance.

11.8.7 Skin protection

Information should be included on the skin protection required for a hazardous chemical. It is important to specify:

- the protective equipment to be worn when using or handling the hazardous chemical including the types of gloves, boots and bodysuits required
- the properties of the protective equipment based on the hazard of the chemical and potential for contact, for example cotton, PVC or nitrile.

11.8.8 Respiratory protection

If respiratory protection is needed for a hazardous chemical, the SDS should include information on the appropriate types of respiratory protection based on the chemical hazard and potential for exposure, for example air-purifying respirators requiring specific respiration filters, air-line respirator or breathing apparatus. Where appropriate, a reference to a standard should be included.

Vague information – for example “use respirator” – is not acceptable, whereas “use half-face filter respirator suitable for organic vapours” is acceptable.

11.8.9 Thermal hazards

The SDS should include information on the PPE required for thermal hazards. Special consideration should be given to the materials of the PPE to avoid adding to the thermal load of the wearer. Information on any secondary risk should also be included here.

See also Section 5 – *Fire fighting measures* of the SDS for specific fire/chemical PPE advice.

11.9 Section 9 – Physical and chemical properties

This section of the SDS describes the physical and chemical properties of a hazardous chemical. The data should apply to the hazardous chemical as supplied. If the hazardous chemical is a mixture, the physico-chemical data should describe the mixture. If that information is not available, the properties of the most relevant ingredients should be provided.

The following properties should be included in the SDS where relevant and the appropriate units of measure and/or reference conditions should be specified:

- Appearance (physical state, colour etc)
- Odour
- Odour threshold
- pH
- Melting point/freezing point
- Initial boiling point and boiling range
- Flash point
- Evaporation rate
- Flammability (solid, gas)
- Upper/lower flammability or explosive limits
- Vapour pressure

- Vapour density
- Relative density
- Solubility
- Partition coefficient: n-octanol/water
- Auto-ignition temperature
- Decomposition temperature
- Viscosity

If relevant, the interpretation of the numeric value and the method of the determination should also be provided. Where there is no information about specific characteristics or data available, a statement should be included to that effect. It is not appropriate to leave blank spaces or use the term ‘N/A’ in an SDS.

In addition to those listed above, other physical or chemical parameters relevant to health and safety should be included in this section of the SDS. This includes parameters which, in addition to chemistry, can significantly influence the properties of chemicals, for example size or surface area in the case of engineered nanomaterials. Examples of parameters which may be included are:

- Specific heat value
- Saturated vapour concentration (include reference temperatures)
- Release of invisible flammable vapours and gases
- Particle size (average and range)
- Size distribution
- Shape and aspect ratio
- Crystallinity
- Dustiness
- Surface area
- Degree of aggregation or agglomeration, and dispersibility
- Redox potential
- Biodurability or biopersistence
- Surface coating or chemistry (if different to rest of particle).

11.10 Section 10 – Stability and reactivity

This section of the SDS provides information regarding the stability and reactivity of the hazardous chemical. Information on the possibility of hazardous reactions is necessary to ensure the safe handling and storage of chemicals and to ensure effective fire fighting and spill control measures.

11.10.1 Reactivity

This section should describe the reactivity hazards of the chemical, including the conditions under which the hazardous reactions may occur, for example:

- whether the hazardous chemical will react or polymerise
- flame propagation or burning rate of solid materials
- properties of both flammable and non-flammable materials that may initiate or add to the intensity of a fire
- potential for dust explosion
- reactions that release flammable or toxic gases or vapours
- fast or intensely burning characteristics

- non-flammables that could contribute to unusual hazards to a fire, for example strong oxidising and reducing agents or peroxide fumes.

Specific test data should be provided for the hazardous chemical as a whole, where available. However, the information may also be based on general data for the class or family of chemical if such data adequately represents the anticipated hazard of the hazardous chemical.

If data for mixtures is not available, ingredient data should be provided. In determining incompatibility, the substances, containers and contaminants that the hazardous chemical might be exposed to during transportation, storage and use should be considered.

11.10.2 Chemical stability

Information should be provided on the stability of the hazardous chemical under normal ambient storage and handling conditions. Consider any foreseeable changes in temperature and pressure conditions. Any stabilisers used to maintain the product should be described, as well as the safety implications of any change in the physical appearance of the product which may result if the stabiliser is compromised.

11.10.3 Possibility of hazardous reactions

If relevant, the SDS should state if a hazardous chemical will react or polymerise, releasing excess pressure or heat, or create other hazardous conditions. It should describe under what conditions a hazardous reaction may occur.

11.10.4 Conditions to avoid

Information should include conditions – for example, temperature, pressure, shock, static discharge, vibrations or other physical stresses – that might cause a hazardous reaction.

11.10.5 Incompatible materials

Classes of chemicals or specific substances with which the hazardous chemical could react to produce a hazardous situation should be listed in the SDS, for example, explosion, excessive heat generation, release of toxic or flammable materials.

11.10.6 Hazardous decomposition products

The SDS should list any hazardous products that may be produced due to the decomposition of the chemical during use, storage or heating. The anticipated outcomes of a reaction with another material should be described, including the production of flammable, toxic or asphyxiating gases. Advice should be provided about what should be done if an unstable state is reached.

Hazardous combustion products should be included in Section 5 – *Fire Fighting Measures of the SDS.*

11.11 Section 11 – Toxicological Information

This section of the SDS provides toxicological information relevant to the health hazard category assigned to the chemical using the *GHS*. It should be based on expert toxicological advice and on the toxicological hazards information provided in the *GHS* classification criteria. A concise but complete and comprehensible description of the various toxicological health effects (for both acute and chronic effects) consistent with hazard classification, and the available data used to identify those effects, should be provided. The relevant hazards for which data should be provided are:

- acute toxicity

- skin corrosion/irritation
- serious eye damage/irritation
- respiratory or skin sensitisation
- germ cell mutagenicity
- carcinogenicity
- reproductive toxicity
- Specific Target Organ Toxicity (STOT) – single exposure
- Specific Target Organ Toxicity (STOT) – repeated exposure
- aspiration hazard.

Information on these hazards should be presented in the above order in each SDS. Other non-classifiable hazards may also be included. For example, some chemicals readily penetrate the skin and may increase skin absorption of other toxins, such as dimethyl sulfoxide. Information should also be provided on whether potential exposure to the hazardous chemical has immediate or delayed health effects.

If data for any of these hazards is not available, they should still be listed with a statement that data is not available.

The toxicological data should apply to the hazardous chemical as used in the workplace. It should be relevant to the mixture. Where information on the mixture is not available, then information on the toxicological properties of the hazardous ingredients above the concentration cut-off in the mixture should be provided. If there is no data on a mixture but sufficient data exists on the components of the mixture or similar mixtures, bridging principles can be used to provide information. The type of bridging principles used should also be stated.

The health effects included in the SDS should be consistent with those described in studies used for the classification of the hazardous chemical. General statements – for example “Toxic” – with no supporting data or “Safe if properly used” are not acceptable as they may be misleading and do not provide a description of health effects. Phrases such as “not applicable” and “not relevant”, or leaving blank spaces in the health effects section, can lead to confusion and misunderstanding and should not be used.

For health effects where information is not available, this should be clearly stated. Health effects should be described accurately and relevant distinctions made. For example, allergic contact dermatitis and irritant contact dermatitis should be distinguished from each other.

Where there is a substantial amount of test data on the hazardous chemical, the results should be summarised for example, by grouping toxicological data by the route of exposure.

Information should also be provided on the relevant negative data. Information to support negative test results should be included, for example “carcinogenicity studies in the rat have shown no significant increase in the incidence of cancer”.

11.11.1 Information on possible routes of exposure

Information should be provided on the possible routes of exposure and the effects of the hazardous chemical via each route of exposure, that is, through ingestion (swallowing), inhalation or skin/eye exposure. A statement should be made if health effects are not known. Statements such as “Ingestion is not expected to occur” or “Ingestion should be avoided” are not acceptable.

Information on all routes of exposure should be provided as it is not possible to predict how a chemical will be used in a workplace or the most likely exposure route.

11.11.2 Early onset symptoms related to exposure

Information should be provided on early symptoms associated with exposure to the hazardous chemical, its ingredients or known by-products. It should include information on the symptoms related to the physical, chemical and toxicological characteristics of the hazardous chemical following exposure related to the intended uses. This section should describe the first symptoms at the lowest exposures through to the consequences of severe exposure, for example, “Headaches and dizziness may occur, proceeding to fainting or unconsciousness; large doses may result in coma and death”.

11.11.3 Delayed health effects from exposure

Information should be provided on whether delayed or immediate effects can be expected after short or long term exposure consistent with the classification of the chemical. Information should include acute and chronic health effects relating to human exposure to the hazardous chemical.

Where human data is not available, animal data should be summarised and the species clearly identified. The SDS should indicate whether toxicological data is based on human or animal data. Classifications or studies from government or international agencies may be used, for example “Has been classified as a probable human carcinogen by the International Agency for Research on Cancer”. Where data on chronic effects is not available, it is recommended that the SDS take a precautionary approach to health effects from exposure.

11.11.4 Exposure levels and health effects

The SDS should provide information on the dose, concentration or conditions of exposure that may cause adverse health effects. Where appropriate, doses should be linked to symptoms and effects, including the period of exposure likely to cause harm. For example, “10 ppm respiratory irritation, 250-300 ppm difficulty in breathing, 500 ppm unconsciousness leading to death after 30 minutes”. Where exposure levels are not known, the SDS should take a precautionary approach to exposure levels or include links to potential health effects, if available.

11.11.5 Interactive effects

If known, information on interactions should be included in situations where:

- symptoms are worsened by drinking alcohol, taking medication or smoking
- pre-existing medical conditions – for example, asthma, high blood pressure or a predisposition to allergic reactions – may increase risk.

11.11.6 When specific chemical data is not available

Where there is insufficient data to classify a chemical, testing may be required. However, it may not always be possible to obtain information on the hazards of a chemical. In cases where data on the specific hazardous chemical is not available, data on the chemical functional group, if appropriate, should be used. Where generic data is used or where data is not available, this should be stated clearly in the SDS.

11.11.7 Mixtures of chemicals

If a mixture has not been tested for its health effects as a whole, then information must be provided on each ingredient listed under Section 3 – *Composition and Information on Ingredients*.

Ingredients may interact with each other in the body resulting in different rates of absorption, metabolism and excretion. As a result, the toxic actions may be altered and the overall toxicity of the mixture may be different from its ingredients.

This section should advise whether the concentration of each ingredient is sufficient to contribute to the overall health effects of the mixture. The information on toxic effects should be presented for each ingredient, except:

- if the information is duplicated, in which case it is not necessary to list this more than once (for example, if two ingredients both cause vomiting and diarrhoea, the mixture should be described overall as causing vomiting and diarrhoea)
- if it is unlikely that these effects will occur at the concentrations present (for example, when a mild irritant is diluted in a non-irritating solution, the overall mixture would be unlikely to cause irritation).

Predicting the interactions between ingredients is difficult where information on interactions is not available. However, assumptions should not be made. Instead, the SDS should list the health effects of each ingredient separately

11.11.8 Other information

It is recommended that other relevant information on adverse health effects be included for hazards even when they are outside the scope of this Recognised Standard.

11.12 Section 12 – Ecological information

This section of the SDS provides information about the environmental and ecological hazards of hazardous chemicals. This information can assist in handling spills and evaluating waste treatment practices and should clearly indicate species, media, units, test duration and test conditions. Where information is not available, this also should be stated.

Ecological information should be given for each ingredient, where available and appropriate.[10]

11.12.1 Ecotoxicity

Information on ecotoxicity should be provided using data from tests performed on aquatic and/or terrestrial organisms. This should include relevant available data on both acute and chronic aquatic toxicity for fish, crustaceans, algae and other aquatic plants. In addition, toxicity data on other organisms (including soil micro and macro-organisms) for example birds, bees and plants, should be included when available. Where the hazardous chemical has inhibitory effects on the activity on micro-organisms, the possible impact on sewage treatment plants should be mentioned.

11.12.2 Persistence and degradability

Persistence and degradability is the potential for the hazardous chemical (or hazardous ingredients of a mixture) to degrade in the environment, either through biodegradation or other processes, for example oxidation or hydrolysis. Test results relevant to assess persistence and degradability should be given where available. If degradation half-lives are quoted an indication of whether these half-lives refer to mineralisation or to primary degradation should be provided. The potential for the hazardous chemical (or hazardous ingredients of a mixture) to degrade in sewage treatment plants may also be mentioned.

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[10] Further ecological information, such as ecotoxicity, persistence, degradability and mobility, may be available from chemical assessments undertaken by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) or the Australian Pesticides and Veterinary Medicines Authority (APVMA).

11.12.3 Bioaccumulative potential

Bioaccumulation is the potential for the hazardous chemical (or hazardous ingredients of a mixture) to accumulate in biota and possibly pass through the food chain. Test results relevant to assess the bioaccumulative potential should be given. This may include reference to the octanol-water partition coefficient (K_{ow}) and bioconcentration factor (BCF), if available.

11.12.4 Mobility in soil

Mobility in soil is the potential for a hazardous chemical (or hazardous ingredients of a mixture) released into the environment to move under natural forces to the groundwater or to a distance from the site of release. The potential for mobility in soil should be provided in an SDS where the information is available. Information on mobility can be determined from relevant mobility data sets, for example absorption studies or leaching studies. For example, K_{oc}[11] values can be predicted from octanol/water partition coefficients (K_{ow}). Leaching and mobility can be predicted from models.

Where real data on the hazardous chemical is available, this data should take precedence over models and predictions.

11.12.5 Other adverse effects

Information on any other adverse effects to the environment should be included where data is available, for example environmental fate (exposure), ozone depletion potential, photochemical ozone creation potential, endocrine-disrupting potential and global warming potential.

11.13 Section 13 – Disposal considerations

This section of the SDS provides information on the most effective way to dispose of a chemical safely.

11.13.1 Disposal methods

Information should be provided for proper disposal, recycling or reclamation of the hazardous chemical and its container to assist in the determination of safe and environmentally-preferred waste management options. This section should include:

- Disposal containers and methods.
- Physical/chemical properties that may affect disposal options.
- Effects of sewage disposal.
- Special precautions for incineration or landfill.

The disposal advice provided on the SDS should apply to the material as manufactured.

For the safety of persons conducting disposal, recycling or reclamation activities, refer to the information in Section 8 – *Exposure Controls and Personal Protection* of the SDS.

The local council and /or state environment authority may be able to provide advice on the disposal of chemicals.

11.14 Section 14 – Transport Information

This section provides basic classification information for the transportation or shipment of a hazardous chemical by road, rail, sea or air as required by relevant transport legislation. Where information is not available or relevant this should be stated.

[11] Soil organic carbon partition coefficient

UN number	The UN number (i.e. four-digit identification number of the substance or article) as listed in the *ADG Code* should be provided.
Proper shipping name or Technical Name	The Proper Shipping Name or Technical Name from the *ADG Code* should also be included. For hazardous chemicals, the Proper Shipping Name or Technical Name should be provided in this subsection even if it has not appeared as the product identifier or national or regional identifiers.
Transport hazard class	The SDS should provide the transport class/division (and subsidiary risks) assigned to the hazardous chemical according to the most predominant hazards that the chemical presents under the *ADG Code.*
Packing Group	If applicable, information should be provided on the Packing Group number found in the *ADG Code*. The Packing Group number is assigned to certain hazardous chemicals in accordance with their degree of hazard. Packing Group I is the highest hazard and Packing Group III the lowest.
Environmental hazards for Transport Purposes	The SDS should indicate whether the hazardous chemical is a known marine pollutant according to the *International Maritime Dangerous Goods (IMDG) Code*. Also it is recommended that the SDS indicate whether the substance or mixture is classified as having an acute aquatic toxicity hazard as required under the *ADG Code.* Additional information for certain environmentally hazardous chemicals may be required on the SDS to comply with maritime transport laws, for example, for chemicals listed in Annex 1 of the *International Convention for the Prevention of Pollution from Ships (MARPOL), or the requirements from the International Convention for the Safety of Life at Sea (SOLAS Convention) under International Maritime Solid Bulk Cargoes (IMSBC) Code and Supplement.*
Special Precautions for user	Information should be provided on special precautions that users should be aware of or should comply with when transporting a hazardous chemical. Any other special requirements relevant to transport of the chemical should be stated here, for example shock sensitivity, specific storage requirements during transit/warehousing and overseas regulatory transport requirements if the hazardous chemical is for export.
Additional Information	Any additional information required by overseas regulatory agencies or relevant Regulations for the transport of goods by other modes should be included here.
Hazchem or Emergency Action Code	The relevant *Hazchem (or Emergency Action) Code* must be provided as specified in the *ADG Code.*

11.15 Section 15 – Regulatory Information

This section of the SDS provides advice on other regulatory information on the hazardous chemical that is not provided elsewhere in the SDS, for example whether the hazardous chemical is subject to the following international agreements:

- Montreal Protocol (Ozone depleting substances)[12]
- The Stockholm Convention (Persistent Organic Pollutants)[13]
- The Rotterdam Convention (Prior Informed Consent)[14]
- Basel Convention (Hazardous Waste)[15]
- International Convention for the Prevention of Pollution from Ships (MARPOL)
- The International Convention for the Safety of Life at Sea (SOLAS Convention) for all solid Bulk Cargoes (IMSBC Code).

11.15.1 Safety, health and environmental regulations

Other regulatory information specific to the hazardous chemical may also be included here, for example whether the substance is covered by the following requirements:

- the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) established under the *Therapeutic Goods Act 1989* (Commonwealth) (as amended). If so, list the relevant Poisons Schedule number
- any applicable prohibition or notification/licensing requirements, including for carcinogens under Commonwealth, State or Territory legislation
- the *Agricultural and Veterinary Chemicals Act 1988* (Commonwealth) and/or applicable Commonwealth, State or Territory control-of-use legislation
- the *Industrial Chemicals (Notification and Assessment) Act 1989* (Commonwealth), including listing on the Australian Inventory of Chemical Substances (AICS), any condition of use associated with the listing on the AICS and/or whether any chemical or a chemical in the product is being introduced under a permit. In addition, it is recommended that information in a NICNAS assessment report be included.

11.163.16 Section 16 – Other information

This section of the SDS provides any other information relevant to the preparation of the SDS, including:

- the date of preparation of the latest revision of the SDS. When revisions are made to an SDS, clearly indicate where the changes have been made to the previous version of the SDS. Suppliers should maintain an explanation of the changes and be willing to provide it upon request
- a key/legend to abbreviations and acronyms used in the SDS.

Key literature references and sources for data used to compile the SDS should also be included.

[12] Montreal Protocol means the Montreal Protocol on Substances that Deplete the Ozone Layer, as adjusted and/or amended.

[13] Stockholm Convention means the Stockholm Convention on Persistent Organic Pollutants.

[14] Rotterdam Convention means the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

[15] Basel Convention means the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Appendices

Appendix 1-A – Definitions and abbrevitations

Article means a manufactured item, other than a fluid or particle, that:

- is formed into a particular shape or design during manufacture, and
- has hazard properties and a function that are wholly or partly dependent on the shape or design.

Bioaccumulative potential is the potential for a chemical to accumulate in biota and possibly pass through the food chain.

Biological monitoring means the measurement and evaluation of a substance, or its metabolites, in the body tissue, fluids or exhaled air of a person exposed to that substance.

CAS Name is the chemical name recommended by the Chemical Abstracts Service, Columbus, Ohio, USA.

Chemical identity means a name, in accordance with the nomenclature systems of the International Union of Pure and Applied Chemistry or the Chemical Abstracts Service, or a technical name, that gives a chemical a unique identity.

Class of dangerous goods, means the number assigned to the goods in the ADG Code indicating the hazard, or most predominant hazard, exhibited by the goods.

Class label means a pictogram described in the *ADG Code* for a class, or division of a class, of dangerous goods.

Combustible liquid means a liquid, other than a flammable liquid, that has a flash point, and a fire point less than its boiling point.

Combustible substance means a substance that is combustible and includes dust, fibres, fumes, mists or vapours produced by the substance.

Consumer product means a thing that:

- is packed or repacked primarily for use by a household consumer or for use in an office
- if the thing is packed or repacked primarily for use by a household consumer—is packed in the way and quantity in which it is intended to be used by a household consumer
- if the thing is packed or repacked primarily for use in an office—is packed in the way and quantity in which it is intended to be used for office work.

Container means anything in or by which a hazardous chemical is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container.

Correct classification means the set of hazard classes and hazard categories assigned to a hazardous chemical when it is correctly classified.

Division, of dangerous goods, means a number, in a class of dangerous goods, to which the dangerous goods are assigned in the *ADG Code*.

Explosives Code means the *Australian Code for the Transport of Explosives by Road and Rail* endorsed by the Workplace Relations Ministers' Council as amended from time to time.

Exposure standard means an exposure standard published by Safe Work Australia in the *Workplace Exposure Standards for Airborne Contaminants.*

Note: Workplace Exposure Standards for Airborne Contaminants will replace the Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational

Environment [NOSHC:1003(1995)].

Flammable Liquid means a flammable liquid within the meaning of the GHS that has a flashpoint of less than 93°C.

Flash point means the lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapours of a liquid to ignite under specified test conditions.

Generic name means a name applied to a group of chemicals having a similar structure and properties.

Genuine research means systematic investigative or experimental activities that are carried out for either acquiring new knowledge (whether or not the knowledge will have a specific practical application) or creating new or improved materials, products, devices, processes or services.

GHS means the Globally Harmonised System of Classification and Labelling of Chemicals, Third revised edition, published by the United Nations.

Hazchem Code means 'Hazchem Code' under the ADG Code, also known as the Emergency Action Code.

Hazard means a situation or thing that has the potential to harm people, property or the environment.

Hazard category means a division of criteria within a hazard class in the GHS.

Hazard class means the nature of a physical, health or environmental hazard and includes a class of dangerous goods

Hazard pictogram means a graphical composition, including a symbol plus other graphical elements, that is assigned in the GHS to a hazard class or hazard category.

Hazard statement means a statement assigned to a hazard class or hazard category describing the nature of the hazards of a hazardous chemical including, if appropriate, the degree of hazard.

Import means to bring into the jurisdiction from outside Australia.

Ingredient means any component of a mixture.

In transit—a thing is ***in transit*** if the thing:

- is supplied to, or stored at, a workplace in containers that are not opened at the workplace, and
- is not used at the workplace, and
- is kept at the workplace for not more than five consecutive days.

ISO name is a chemical name approved by the International Organisation for Standardisation.

IUPAC name is the chemical name recommended by the International Union of Pure and Applied Chemistry.

Laboratory means a building or room equipped for analysis, genuine research or practical teaching, and which is not used for production purposes.

Label means written, printed or graphical information elements concerning a hazardous chemical that is affixed to, printed on or attached to the container of a hazardous chemical.

Manufacture includes the activities of packing, repacking, formulating, blending, mixing, making, remaking and synthesising.

Mixture means a combination of, or a solution composed of, two or more substances that do not react with each other.

Physico-chemical means the physical properties of a chemical.

Precautionary Statement means a phrase prescribed by the GHS that describes recommended measures to be taken to prevent or minimise the adverse effects of exposure to a hazardous chemical or the improper handling of a hazardous chemical.

Product identifier means the name or number used to identify a product on a label or in a safety data sheet.

Proper Shipping Name means a proper shipping name under the *ADG Code*.

Research chemical means a substance or mixture that is manufactured in a laboratory for genuine research and is not for use or supply for a purpose other than analysis or genuine research.

Safety data sheet **(SDS)** means a document that describes the identity, properties (that is to say chemical and physical properties and health hazard and environmental hazard information), uses, precautions for use, safe handling procedures and safe disposal procedures of a hazardous chemical.

Signal word means the word **danger** or **warning** used on a label to indicate to a label reader the relative severity level of a hazard, and to alert the reader to a potential hazard, under the GHS.

Substance means a chemical element or compound in its natural state or obtained or generated by a process:

- including any additive necessary to preserve the stability of the element or compound and any impurities deriving from the process, but
- excluding any solvent that may be separated without affecting the stability of the element or compound, or changing its composition.

Supply includes selling or transferring ownership or responsibility for a chemical.

SUSMP means the Standard for the Uniform Scheduling of Medicines and Poisons, published by the National Drugs and Poisons Schedule Committee as amended from time to time.

Technical name means a name that is:

- ordinarily used in commerce, regulations and codes to identify a substance or mixture, other than an International Union of Pure and Applied Chemistry or Chemical Abstracts Service name
- recognised by the scientific community.

Transfer includes the pumping, dispensing or decanting from one container into another or from one place to another.

UN Number means the number assigned to dangerous goods by the United Nations Subcommittee of Experts on the Transport of Dangerous Goods. UN Numbers are published in the UN Recommendations on the Transport of Dangerous Goods – Model Regulation, and in the *ADG Code.*

Appendix 1-B – Classification tables of mixtures

The following tables replace some of the tables in GHS with respect to classification of hazardous chemicals. The GHS is as defined in the CMSHR dictionary.

Table B.1 Classification of mixtures containing respiratory or skin sensitisers

Cut-off values/concentration limits of ingredients of a mixture classified as either a respiratory sensitiser or a skin sensitiser that would trigger classification of the mixture.

Item	Ingredient classification	Mixture classification		
		Skin sensitiser Category 1	Respiratory sensitiser Category 1	
		All physical states	Solid/liquid	Gas
1	Skin sensitiser Category 1	≥ 1·0%		
2	Skin sensitiser Sub-category 1A	≥ 0·1%		
3	Skin sensitiser Sub-category 1B	≥ 1·0%		
4	Respiratory sensitiser Category 1		≥ 1·0%	≥ 0·2%
5	Respiratory sensitiser Sub-category 1A		≥ 0·1%	≥ 0·1%
6	Respiratory sensitiser Sub-category 1B		≥ 1·0%	≥ 0·2%

Note

Table B.1 replaces table 3.4.5 in the GHS, p. 151.

Table B.2 Classification of mixtures containing carcinogens

Cut-off values/concentration limits of ingredients of a mixture classified as a carcinogen that would trigger classification of the mixture.

Item	Ingredient classification	Mixture classification	
		Category 1 carcinogen	Category 2 carcinogen
1	Category 1 carcinogen	≥ 0·1%	
2	Category 2 carcinogen		≥ 1·0%

Notes

1 The concentration limits in table B.2 apply to solids and liquids (w/w units) and gases (v/v units).

2 Table B.2 replaces table 3.6.1 in the GHS, p. 166.

Table B.3 Classification of mixtures containing reproductive toxicants

Cut-off values/concentration limits of ingredients of a mixture classified as a reproductive toxicant or for effects on or via lactation that would trigger classification of the mixture.

Item	Ingredient classification	Mixture classification		
		Category 1 reproductive toxicant	**Category 2 reproductive toxicant**	**Additional category for effects on or via lactation**
1	Category 1 reproductive toxicant	≥ 0·3%		
2	Category 2 reproductive toxicant		≥ 3·0%	
3	Additional category for effects on or via lactation			≥ 0·3%

Notes

1 The concentration limits in table B.3 apply to solids and liquids (w/w units) and gases (v/v units).

2 Table B.3 replaces table 3.7.1 in the GHS, p. 180.

Table B.4 Classification of mixtures containing specific target organ toxicants (single exposure)

Cut-off values/concentration limits of ingredients of a mixture classified as a specific target organ toxicant that would trigger classification of the mixture.

Item	Ingredient classification	Mixture classification	
		Category 1	**Category 2**
1	Category 1 specific target organ toxicant	Concentration ≥ 10%	1·0% ≤ concentration < 10%
2	Category 2 specific target organ toxicant		Concentration ≥ 10%

Notes

1 The concentration limits in table B.4 apply to solids and liquids (w/w units) and gases (v/v units).

2 Table B.4 replaces table 3.8.2 in the GHS, p. 192.

Table B.5 Classification of mixtures containing specific target organ toxicants (repeated exposure)

Cut-off values/concentration limits of ingredients of a mixture classified as a specific target organ toxicant that would trigger classification of the mixture.

Item	Ingredient classification	Mixture classification	
		Category 1	**Category 2**
1	Category 1 specific target organ toxicant	Concentration ≥ 10%	1·0% ≤ concentration < 10%
2	Category 2 specific target organ toxicant		Concentration ≥ 10%

Notes

1 The concentration limits in table B.5 apply to solids and liquids (w/w units) and gases (v/v units).

2 Table B.5 replaces table 3.9.3 in the GHS, p. 203.

Appendix 1-C – Checklist for preparation of a label

The following table lists the steps that are recommended for the preparation of a label for a hazardous chemical. The information is intended for use as a quick reference guide. It may not apply to all situations. The relevant sections of this Recognised Standard should be referred to for full details
of the labelling requirements.

Step		Comments/Reference information
1	Select the suitable product identifier.	
2	Determine which ingredients require disclosure.	Refer to Subsection 2.2 for ingredient disclosure requirements.
3	Select the label elements which apply to classification endpoints or hazard categories, in accordance with correct hazard classification	Label elements applicable to all hazard categories are tabulated in Appendix 1-E.
4	Combine all applicable elements, and then determine which elements may be omitted from the label to avoid duplication or redundancy.	Refer to Appendix 1-F for precedence rules and hierarchy of elements.
5	Determine which label elements may be omitted where a special labelling situation may apply.	Refer to Part 1, section 3.
6	Determine whether other relevant health and safety information may be required.	Particularly important for hazard endpoints not covered by the GHS but where there are health and safety concerns
7	Select the appropriate supplier details to be included.	Other information, for example web address or emergency contact phone number, may be included.
8	Determine whether an expiry date is required.	Expiry date is required if degradation over time could change the hazard classification. For example, if a highly toxic impurity is formed.
9	Identify any other relevant information that may be required.	For example, reference to SDS or product use information.
10	Design the label layout and grouping of information.	Refer to Part 1, section 4.

Appendix 1-D – Guides for selecting generic names

This guide describes a procedure for naming hazardous chemicals and the division of substances into families.

The families are defined in the following manner:

- inorganic or organic substances whose properties are identified by having a common chemical element as their chief characteristic. The family name is derived from the name of the chemical element. These families are identified as in subsection 1-D1.3 below by the atomic number of the chemical element (001 to 103)
- organic substances whose properties are identified by having a common functional group as their chief characteristic.
    - the family name is derived from the functional group name, and
    - these families are identified by the number convention found in subsection 1-D1.3 (601 to 650).
- sub-families bringing together substances with a common specific character have been added in certain cases.

Establishing the generic name

1-D.1. General principles

In selecting a generic name, the following approach is adopted:

- identify the functional groups and chemical elements present in the molecule
- determine the most important functional groups and chemical elements, which contribute to its properties.

The identified functional groups and elements taken into account are the names of the families and sub-families. These names are set out in subsection D.3 in the form of a (non-restrictive) list.

1-D.2. Practical application

After having conducted a search to see if the substance belongs to one or more families or sub-families on the list, the generic name can be established in the following way:

a) If the name of a family or sub-family is sufficient to characterise the chemical elements or important functional groups, this name will be chosen as the generic name.

Examples:

Name	**Family** **Sub-family**	**Generic Name**
1,4-dihydroxybenzene	604: Phenols and derivatives	Phenol derivative
Butanols	603: Alcohols and derivatives Aliphatic alcohols	Aliphatic alcohol
2-isopropoxyethanol	603: Alcohols and derivatives Glycolethers	Glycolether
Methacrylate	607: Organic acids and derivatives Methacrylates	Methacrylate

b) If the name of a family or sub-family is not sufficient to characterise the chemical elements of important functional groups, the generic name should be a combination of the corresponding different family or sub-family names.

Examples:

Name	**Family** **Sub-family**	**Generic Name**
Lead hexafluorosilicate	009: Fluorine compounds Inorganic fluorides 082: Lead compounds	Inorganic lead fluoride
Chlorobenzene	602: Halogenated hydrocarbons Halogenated aromatic hydrocarbons 017: Chlorine compounds	Chlorinated aromatic hydrocarbon
2,3,6-Trichlorophenylacetic acid	607: Organic acids and derivatives Halogenated aromatic acids 017: Chlorine compounds	Chlorinated aromatic acid
1-Chloro-1-nitropropane	610: Chloronitrated compounds 601: Hydrocarbons Aliphatic hydrocarbons	Chlorinated aliphatic hydrocarbon
Tetrapropyl dithiopyrophosphate	015: Phosphorus compounds Phosphoric esters 016: Sulphur compounds	Thiophosphoric ester

c) In the case of certain elements, notably metals, the name of the family or sub-family may be indicated by the words 'organic' or 'inorganic'.

Examples:

Name	**Family** **Sub-family**	**Generic Name**
Dimercury dichloride	080: Mercury compounds	Inorganic mercury compound
Barium acetate	056: Barium compounds	Organic barium compound
Ethyl nitrite	007: Nitrogen compounds Nitrites	Organic nitrite
Sodium hydrosulphite	016: Sulphur compounds	Inorganic sulphur compound

1-D.3. Division of substances into families and sub-families

Family No	Families Sub-families
001	Hydrogen compounds Hydrides
003	Lithium compounds
004	Beryllium compounds
005	Boron compounds Boranes Borates
006	Carbon compounds Carbamates Inorganic carbon compounds Salts of hydrogen cyanide Urea and derivatives
007	Nitrogen compounds Quaternary ammonium compounds Acid nitrogen compounds Nitrates Nitrites
008	Oxygen compounds
009	Fluorine compounds Inorganic fluorides
011	Sodium compounds
012	Magnesium compounds Organometallic magnesium derivatives
013	Aluminium compounds Organometallic aluminium derivatives
014	Silicon compounds Silicones Silicates

Family No	Families Sub-families
015	Phosphorus compounds Acid phosphorus compounds Phosphonium compounds Phosphoric esters Phosphates Phosphites Phosphoramides and derivatives
016	Sulphur compounds Acid sulphur compounds Mercaptans Sulphates Sulphites
017	Chlorine compounds Chlorates Perchlorates
018	Argon compounds
019	Potassium compounds
020	Calcium compounds
021	Scandium compounds
022	Titanium compounds
023	Vanadium compounds
024	Chromium compounds Chromium VI compounds
025	Manganese compounds
026	Iron compounds
027	Cobalt compounds
028	Nickel compounds
029	Copper compounds
030	Zinc compounds Organometallic zinc derivatives
031	Gallium compounds
032	Germanium compounds
033	Arsenic compounds
034	Selenium compounds
035	Bromine compounds

Family No	Families Sub-families
036	Krypton compounds
037	Rubidium compounds
038	Strontium compounds
039	Yttrium compounds
040	Zirconium compounds
041	Niobium compounds
042	Molybdenum compounds
043	Technetium compounds
044	Ruthenium compounds
045	Rhodium compounds
046	Palladium compounds
047	Silver compounds
048	Cadmium compounds
049	Indium compounds
050	Tin compounds Organometallic tin derivates
051	Antimony compounds
052	Tellurium compounds
053	Iodine compounds
054	Xenon compounds
055	Caesium compounds
056	Barium compounds
057	Lanthanum
058	Cerium compounds
059	Praseodymium compounds
060	Neodymium compounds
061	Promethium compounds
062	Samarium compounds
063	Europium compounds
064	Gandolinium compounds
065	Terbium compounds
066	Dysprosium compounds
067	Holmium compounds
068	Erbium compounds
069	Thulium compounds

Family No	Families Sub-families
070	Ytterbium compounds
071	Lutetium compounds
072	Hafnium compounds
073	Tantalum compounds
074	Tungsten compounds
075	Rhenium compounds
076	Osmium compounds
077	Iridium compounds
078	Platinum compounds
079	Gold compounds
080	Mercury compounds Organometallic mercury derivatives
081	Thallium compounds
082	Lead compounds Organometallic lead derivatives
083	Bismuth compounds
084	Polonium compounds
085	Astate compounds
086	Radon compounds
087	Francium compounds
088	Radium compounds
089	Actinium compounds
090	Thorium compounds
091	Protactinium compounds
092	Uranium compounds
093	Neptunium compounds
094	Plutonium compounds
095	Americium compounds
096	Curium compounds
097	Berkelium compounds
098	Californium compounds
099	Einsteinium compounds
100	Fermium compounds
101	Mendelevium compounds
102	Nobelium compounds

Family No	Families Sub-families
103	Lawrencium compounds
601	Hydrocarbons Aliphatic hydrocarbons Aromatic hydrocarbons Alicyclic hydrocarbons Polycyclic aromatic hydrocarbons (PAH)
602	Halogenated hydrocarbons* Halogenated aliphatic hydrocarbons* Halogenated aromatic hydrocarbons* Halogenated alicyclic hydrocarbons* * Specify according to family corresponding to halogen.
603	Alcohols and derivates Aliphatic alcohols Aromatic alcohols Alicyclic alcohols Alcanolamines Epoxy derivatives Ethers Glycolethers Glycols and polyols
604	Phenols and derivatives Halogenated phenol derivatives* * Specify according to the family corresponding to halogen.
605	Aldehydes and derivates Aliphatic aldehydes Aromatic aldehydes Alicyclic aldehydes Aliphatic acetals Aromatic acetals Alicyclic acetals
606	Ketones and derivatives Aliphatic Ketones Aromatic Ketones* Alicyclic Ketones * Quinones included

Family No	Families Sub-families
607	Organic acids and derivatives Aliphatic acids Halogenated aliphatic acids* Aromatic acids Halogenated aromatic acids* Alicyclic acids Halogenated alicyclic acids* Aliphatic acid anhydrides Halogenated aliphatic acid anhydrides* Aromatic acid anhydrides Halogenated aromatic acid anhydrides* Alicyclic acid anhydrides Halogenated alicyclic acid anhydrides* Salts of aliphatic acid Salts of halogenated aliphatic acid* Salts of aromatic acid Salts of halogenated aromatic acid* Salts of alicyclic acid Salts of halogenated alicyclic acid* Esters of aliphatic acid Esters of halogenated alicyclic acid* Esters of aromatic acid Esters of halogenated aromatic acid* Esters of alicyclic acid Esters of halogenated alicyclic acid* Esters of glycol ether Acrylates Methacrylates
608	Nitriles and derivatives
609	Nitro compounds
610	Chloronitrated compounds
611	Azoxy and azo compounds

Family No	Families Sub-families
612	Amine compounds Aliphatic amines and derivatives Alicyclic amines and derivatives Aromatic amines and derivatives Aniline and derivatives Benzidine and derivatives
613	Heterocyclic basis and derivatives Benzimidazole and derivatives Imidazol and derivatives Pyrethrinoids Quinoline and derivatives Triazine and derivatives Triazole and derivatives
614	Glycosides and alkaloids Alkaloid and derivatives Glycosides and derivatives
615	Cyanates and isocyanates Cyanates Isocyanates
616	Amides and derivatives Acetamide and derivatives Anilides
617	Organic Peroxides
650	Various substances Do not use this family. Instead, use the families or sub-families mentioned above.

Appendix 1-E – Application of label elements

This appendix is intended to provide guidance for the application of an appropriate signal word, and appropriate hazard pictograms, hazard statements, and precautionary statements. The tables at the end of this appendix specify the signal word, hazard pictograms, hazard statements and precautionary statements that apply to each hazard class and category.

Structure of hazard statement text

All of the hazard statement text that appears in bold should appear on the label, except as otherwise specified.

All of the information that appears in italics should appear as part of the hazard statement, where applicable.

The hazard statement codes shown in the tables are intended to be used for reference purposes only. They are not part of the hazard statement text and should not be used on a label.

Structure of precautionary statement text

There are five types of precautionary statements: **general**, **prevention**, **response** (in case of accidental spillage or exposure, emergency response and first aid), **storage** and **disposal**.

All of the precautionary statement text that appears in bold should appear on the label, except as otherwise specified.

To provide flexibility in the application of precautionary phrases, a combination of statements may be used to save label space and improve the readability of phrases. A combination of phrases can also be useful for different types of hazard where the precautionary behaviour is similar.

When a forward-slash or diagonal mark [*/*] appears in a precautionary statement text, it indicates that a choice has to be made between the phrases they separate

When three full stops [**…**] appear in a precautionary statement text, it indicates that all applicable conditions are not listed.

When text in the precautionary statement text appears in italics, this indicates that specific conditions apply to the use or allocation of the precautionary statement. This may relate to conditions attaching to either the general use of a precautionary statement or its use for a particular hazard class and/or hazard category. The text in italics is not intended to be present on a label.

The precautionary statements included in the following matrices cover general emergency response and first-aid information. For some specific chemicals, supplementary first aid, treatment measures or specific antidotes or cleansing materials may be required. Poisons Centres and/or medical practitioners or specialist advice should be sought in such situations and included on labels where appropriate

The precautionary statement codes that are used in the tables are intended to be used for reference purposes only. They are not part of the precautionary statement text and should not be used on a label.

Precautionary statement formed from a combination of phrases

‘**Keep away from heat, sparks and open flame and store in a cool well ventilated place**’.

Precautionary statement that contains a forward-slash [/]

The precautionary statement:

P280 '**Wear protective gloves/protective clothing/eye protection/face protection**', could read:

'**Wear eye protection**', where the hazard classification does not warrant the additional personal protective equipment.

Precautionary statement that contains three full stops […]

For the precautionary statement:

P241 '**Use explosion-proof electrical/ventilating/lighting/.../equipment'**, the use of '**...**' indicates that other equipment may need to be specified.

Precautionary statement that contains text in italics

The precautionary statement:

P241 '**Use explosion-proof electrical/ventilating/lighting/.../ equipment**', only applies for flammable solids '*if dust clouds can occur*'.

General precautionary statements

General precautionary statements are not aligned with any particular hazard category, and according to the GHS principles, these statements are required for consumer products only. Manufacturers of hazardous chemicals may choose to include these on workplace labels, particularly where it is foreseeable that the chemical may be used in a non-workplace situation.

General precautionary statements

P101 If medical advice is needed, have product container or label at hand

P102 Keep out of reach of children

P103 Read label before use

Allocation of label elements

The matrices below provide the following information for each hazard class and hazard category of the GHS:

a) hazard category; and
b) the assigned symbol; and
c) the assigned signal word; and
d) the assigned hazard statement and code; and
e) the assigned precautionary statements, by precautionary statement type, and code.

Explosives

Symbol
Exploding bomb

Hazard category	Signal word	Hazard statement	
Unstable Explosive	Danger	H200	**Unstable Explosive**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P201 **Obtain special instructions before use.** P202 **Do not handle until all safety precautions have been read and understood.** P281 **Use personal protective equipment as required.**	P372 **Explosion risk in case of fire.** P373 **DO NOT fight fire when fire reaches explosives.** P380 **Evacuate area.**	P401 **Store ...** …in accordance with local/regional/ national/international Regulations (to be specified).	P501 **Dispose of contents/container to...** …in accordance with local/regional/ national/international Regulations (to be specified).

Explosives

Symbol
Exploding bomb

Hazard category	Signal word	Hazard statement
Division 1.1	Danger	H201 **Explosive; mass explosion hazard**
Division 1.2	Danger	H202 **Explosive; severe projection hazard**
Division 1.3	Danger	H203 **Explosive; fire, blast or projection hazard**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P230 **Keep wetted with...** …Manufacturer/supplier or the competent authority to specify appropriate material. - *if drying out increases explosion hazard, except as needed for manufacturing or operating processes (e.g. nitrocellulose).* P240 **Ground/bond container and receiving equipment.** - *if the explosive is electrostatically sensitive.* P250 **Do not subject to grinding/shock/…/friction.** …Manufacturer/supplier or the competent authority to specify applicable rough handling. P280 **Wear face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 +P380 **In case of fire: evacuate area.** P372 **Explosion risk in case of fire.** P373 **DO NOT fight fire when fire reaches explosives.**	P401 **Store ...** …in accordance with local/regional/national/international Regulations (to be specified).	P501 **Dispose of contents/container to...** …in accordance with local/ regional/national/international Regulations (to be specified).

Explosives

Symbol
Exploding bomb

Hazard category	**Signal word**	**Hazard statement**
Division 1.4	Warning	H204 **Fire or projection hazard**

Precautionary statements

Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces**. **- No smoking**. Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P240 **Ground/bond container and receiving equipment.** - *if the explosive is electrostatically sensitive.* P250 **Do not subject to grinding/shock/…/friction**. Manufacturer/supplier or the competent authority to specify applicable rough handling. P280 **Wear face protection.** Manufacturer/supplier or competent authority to specify type of equipment.	P370+P380 **In case of fire: Evacuate area.** P372 **Explosion risk in case of fire.** - except if explosives are *1.4S AMMUNITION AND COMPONENTS THEREOF.* P373 **DO NOT fight fire when fire reaches explosives.** P374 **Fight fire with normal precautions from a reasonable distance.** *- If explosives are 1.4S AMMUNITION AND COMPONENTS THEREOF*.	P401 **Store ...** …in accordance with local/regional/ national/international Regulations (to be specified).	P501 **Dispose of contents/container to...** … in accordance with local/regional/national/international Regulations (to be specified).

Explosives

Hazard category	Signal word	Hazard statement		Symbol*
Division 1.5	Danger	H205	**May mass explode in fire**	

Precautionary statements

Prevention	Response	Storage	Disposal
P210 **Keep away from heat/sparks/open flames/hot surfaces. - No smoking**. Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P230 *Keep wetted with...* …Manufacturer/supplier or the competent authority to specify appropriate material. - *if drying out increases explosion hazard, except as needed for manufacturing or operating processes (e.g. nitrocellulose).* P240 **Ground/bond container and receiving equipment** - *if the explosive is electrostatically sensitive.* P250 **Do not subject to grinding/shock/…/friction**. **…**Manufacturer/supplier or the competent authority to specify applicable rough handling. P280 **Wear face protection.** Manufacturer/supplier or competent authority to specify type of equipment.	P370 + P380 **In case of fire: Evacuate area.** P372 **Explosion risk in case of fire.** P373 **DO NOT fight fire when fire reaches explosives.**	P401 **Store ...** …in accordance with local/regional/ national/international Regulations (to be specified).	P501 **Dispose of contents/container to...** … in accordance with local/regional/ national/international Regulations (to be specified).

*Note: This symbol is according to the ADG Code for the transport of dangerous goods

Explosives

Hazard category	Signal word	Hazard statement	Symbol*
Division 1.6	*No signal word*	*No hazard statement*	

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
No precautionary statements	*No precautionary statements*	*No precautionary statements*	*No precautionary statements*

*Note: Symbol for Explosive Division 1.6 is the symbol used for the transport of dangerous goods

Flammable gases

Hazard category	Signal word	Hazard statement	Symbol Flame
1	Danger	H220 **Extremely flammable gas**	

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces. - No smoking.** Manufacturer/supplier or competent authority to specify applicable ignition source(s).	P377 **Leaking gas fire: Do not extinguish, unless leak can be stopped safely.** P381 **Eliminate all ignition sources if safe to do so.**	P403 **Store in well-ventilated place.**	

*This symbol is according to the ADG Code for the transport of dangerous goods

Flammable aerosols

Symbol
Flame

Hazard category	Signal word	Hazard statement
1	Danger	H222 **Extremely flammable aerosol**
2	Warning	H223 **Flammable aerosol**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces. - No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition sources(s). P211 **Do not spray on an open flame or other ignition source.** P251 **Pressurized container: Do not pierce or burn, even after use.**		P410 + P412 **Protect from sunlight. Do not expose to temperatures exceeding 50ºC/122ºF.**	

Oxidising gases

Symbol
Flame over circle

Hazard category	Signal word	Hazard statement
1	Danger	H270 **May cause or intensify fire; oxidiser**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P220 **Keep/Store away from clothing/…/combustible materials.** …Manufacturer/supplier or the competent authority to specify other incompatible materials. P244 **Keep reduction valves free from grease and oil.**	P370 + P376 **In case of fire: Stop leak if safe to do so.**	P403 **Store in well-ventilated place.**	

Gases under pressure

Symbol
Gas cylinder

Hazard category	Signal word	Hazard statement
Compressed gas	Warning	H280 **Contains gas under pressure; may explode if heated**
Liquefied gas	Warning	H280 **Contains gas under pressure; may explode if heated**
Dissolved gas	Warning	H280 **Contains gas under pressure; may explode if heated**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
		P410 + P403 **Protect from sunlight. Store in a well-ventilated place.**	

Gases under pressure

Symbol
Gas cylinder

Hazard category	Signal word	Hazard statement
Refrigerated liquefied gas	Warning	H281 **Contains refrigerated gas; may cause cryogenic burns or injury**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P282 **Wear cold insulating gloves/face shield/eye protection.**	P336 **Thaw frosted parts with lukewarm water. Do not rub affected area.** P315 **Get immediate medical advice/attention**	P403 **Store in well-ventilated place.**	

Flammable liquids

Symbol
Flame

Hazard category	Signal word	Hazard statement
1	Danger	H224 **Extremely flammable liquid and vapour**
2	Danger	H225 **Highly flammable liquid and vapour**
3	Warning	H226 **Flammable liquid and vapour**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces. No smoking** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P233 **Keep container tightly closed.** P240 **Ground/Bond container and receiving equipment** - *if electrostatically sensitive material is for reloading.* - *if product is volatile* so *as to generate hazardous atmosphere.* P241 **Use explosion-proof electrical/ventilating/ lighting/.../equipment.** ... Manufacturer/supplier or competent authority to specify other equipment. P242 **Use only non-sparking tools.** P243 **Take precautionary measures against static discharge.** P280 **Wear protective gloves/eye protection/face protection** Manufacturer/supplier or competent authority to specify type of equipment.	P303 + P361 + P353 **IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.** P370 + P378 **In case of fire: Use ... for extinction.** ...Manufacturer/supplier or the competent authority to specify appropriate media. **-** *if water increases risk.*	P403 + P235 **Store in a well-ventilated place. Keep cool.**	P501 **Dispose of contents/container to...** … in accordance with local/regional/national/international Regulations (to be specified).

Flammable liquids

Symbol
No symbol

Hazard category	**Signal word**	**Hazard statement**
4	Warning	H227 **Combustible liquid**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from flames and hot surfaces. – No smoking.** P280 **Wear protective gloves / eye protection / face protection** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. **-** *if water increases risk.*	P403 + P235 **Store in a well-ventilated place. Keep cool.**	P501 **Dispose of contents/container to...** in accordance with local/regional/ national/international Regulations (to be specified).

Flammable solids

Symbol
Flame

Hazard category	**Signal word**	**Hazard statement**
1	Danger	H228 **Flammable solid**
2	Warning	H228 **Flammable solid**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P240 **Ground/Bond container and receiving equipment.** - *if electrostatically sensitive material is for reloading.* P241 **Use explosion-proof electrical/ventilating/ lighting/... /equipment.** ... Manufacturer/supplier or the competent authority to specify other equipment. **-** *if dust clouds can occur*. P280 **Wear protective gloves/eye protection/face protection** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction** ...Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.*		

Self-reactive substances and mixtures

Symbol
Exploding bomb

Hazard category	Signal word	Hazard statement
Type A	Danger	H240 **Heating may cause an explosion**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep/Store away from clothing/…/combustible materials.** **...** Manufacturer/supplier or the competent authority to specify other incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.* P370 + P380 + P375 **In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.**	P403 + P235 **Store in a well-ventilated place. Keep cool.** P411 **Store at temperatures not exceeding …°C/…°F.** ... Manufacturer/supplier or the competent authority to specify temperature. P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** … in accordance with local/regional/national/international Regulations (to be specified).

Self-reactive substances and mixtures

Symbol
Exploding bomb and flame

Hazard category	Signal word	Hazard statement
Type B	Danger	H241 **Heating may cause a fire or explosion**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep/Store away from clothing/.../combustible materials.** ... Manufacturer/supplier or the competent authority to specify other incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.* P370 + P380 + P375 **In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.**	P403 + P235 **Store in a well-ventilated place. Keep cool.** P411 **Store at temperatures not exceeding …°C/…°F.** ... Manufacturer/supplier or the competent authority to specify temperature. P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** …in accordance with local/regional/national/international Regulations (to be specified).

Self-reactive substances and mixtures

Symbol
Flame

Hazard category	**Signal word**	**Hazard statement**
Type C	Danger	H242 **Heating may cause a fire**
Type D	Danger	H242 **Heating may cause a fire**
Type E	Warning	H242 **Heating may cause a fire**
Type F	Warning	H242 **Heating may cause a fire**

Precautionary statements

Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep/Store away from clothing/…/combustible materials.** …Manufacturer/supplier or the competent authority to specify other incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.*	P403 + P235 **Store in a well-ventilated place. Keep cool.** P411 **Store at temperatures not exceeding …°C/…°F.** ...Manufacturer/supplier or the competent authority to specify temperature. P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** …in accordance with local/regional/national/international Regulations (to be specified).

Note: Hazard category Type G: There are no label elements allocated to this hazard category

Pyrophoric liquids

Symbol
Flame

Hazard category	Signal word	Hazard statement
1	Danger	H250 **Catches fire spontaneously if exposed to air**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces. - No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition sources(s). P222 **Do not allow contact with air.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P334 **IF ON SKIN: Immerse in cool water/wrap with wet bandages** P370 + P378 **In case of fire: Use ... for extinction** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.*	P422 **Store contents under...** ... Manufacturer/supplier or the competent authority to specify appropriate liquid or inert gas.	

Pyrophoric solids

Symbol
Flame

Hazard category	Signal word	Hazard statement
1	Danger	H250 **Catches fire spontaneously if exposed to air**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces. - No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P222 **Do not allow contact with air.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P335 + P334 **Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.** P370 + P378 **In case of fire: Use ... for extinction** ... Manufacturer/supplier or the competent authority to specify appropriate media. *- if water increases risk.*	P422 **Store contents under...** …Manufacturer/supplier or the competent authority to specify appropriate liquid or inert gas.	

Self-heating substances and mixtures

Symbol
Flame

Hazard category	Signal word	Hazard statement
1	Danger	H251 **Self-heating; may catch fire**
2	Warning	H252 **Self-heating in large quantities; may catch fire**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P235 + P410 **Keep cool. Protect from sunlight.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.		P407 **Maintain air gap between stacks/pallets.** P413 **Store bulk masses greater than … kg/…lbs at temperatures not exceeding …°C/…°F.** ... Manufacturer/supplier or the competent authority to specify mass and temperature. P420 **Store away from other materials.**	

Substances and mixtures which, in contact with water, emit flammable gases

Hazard category	Signal word	Hazard statement
1	Danger	H260 **In contact with water releases flammable gases, which may ignite spontaneously**
2	Danger	H261 **In contact with water releases flammable gases**

Symbol

Flame

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P223 **Keep away from any possible contact with water, because of violent reaction and possible flash fire.** P231 + P232 **Handle under inert gas. Protect from moisture.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P335 + P334 **Brush off loose particles from skin and immerse in cool water/wrap in wet bandages.** P370 + P378 **In case of fire: Use ... for extinction** ... Manufacturer/supplier or the competent authority to specify appropriate media. *- if water increases risk.*	P402 + P404 **Store in a dry place. Store in a closed container.**	P501 **Dispose of contents/container to...** …in accordance with local/regional/national/ international Regulations (to be specified).

Substances and mixtures which, in contact with water, emit flammable gases

Symbol
Flame

Hazard category	Signal word	Hazard statement
3	Warning	H261 **In contact with water releases flammable gases**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P231 + P232 **Handle under inert gas. Protect from moisture.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction.** ...Manufacturer/supplier or the competent authority to specify appropriate media. *- if water increases risk.*	P402 + P404 **Store in a dry place. Store in a closed container.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Oxidising liquids

Symbol
Flame over circle

Hazard category	**Signal word**	**Hazard statement**
1	Danger	H271 **May cause fire or explosion; strong oxidiser**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat.** P220 **Keep/Store away from clothing and other combustible materials.** P221 **Take any precaution to avoid mixing with combustibles/...** ... Manufacturer/supplier or the competent authority to specify other incompatible materials. P280 **Wear protective gloves /eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment. P283 **Wear fire/flame resistant/retardant clothing.**	P306 + P360 **IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.** P371 + P380 + P375 **In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.** P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. *- if water increases risk.*		P501 **Dispose of contents/container to...** …in accordance with local/regional/ national/international Regulations (to be specified).

Oxidising liquids

Symbol
Flame over circle

Hazard category	Signal word	Hazard statement	
2	Danger	H272	**May intensify fire; oxidiser**
3	Warning	H272	**May intensify fire; oxidiser**

Precautionary statements

Prevention	Response	Storage	Disposal
P210 **Keep away from heat.** P220 **Keep/Store away from clothing/…/combustible materials.** **…**Manufacturer/supplier or the competent authority to specify other incompatible materials. P221 **Take any precaution to avoid mixing with combustibles/...** ... Manufacturer/supplier or the competent authority to specify other incompatible materials. P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.*		P501 **Dispose of contents/container to...** …in accordance with local/regional/ national/international Regulations (to be specified).

Oxidising solids

Hazard category	Signal word	Hazard statement	Symbol
1	Danger	H271 **May cause fire or explosion; strong oxidiser**	Flame over circle 

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat.** P220 **Keep away from clothing and other combustible materials.** P221 **Take any precaution to avoid mixing with combustibles/...** …Manufacturer/supplier or the competent authority to specify other incompatible materials. P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment. P283 **Wear fire/flame resistant/retardant clothing.**	P306 + P360 **IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.** P371 + P380 + P375 **In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.** P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. *- if water increases risk.*		P501 **Dispose of contents/container to...** …in accordance with local/regional/ national/international Regulations (to be specified).

Oxidising solids

Symbol
Flame over circle

Hazard category	Signal word	Hazard statement	
2	Danger	H272	**May intensify fire; oxidiser**
3	Warning	H272	**May intensify fire; oxidiser**

Precautionary statements

Prevention	Response	Storage	Disposal
P210 **Keep away from heat.** P220 **Keep/Store away from clothing/…/ combustible materials.** … Manufacturer/supplier or the competent authority to specify incompatible materials. P221 **Take any precaution to avoid mixing with combustibles/...** …Manufacturer/supplier or the competent authority to specify other incompatible materials. P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P370 + P378 **In case of fire: Use ... for extinction.** ... Manufacturer/supplier or the competent authority to specify appropriate media. - *if water increases risk.*		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Organic peroxides

Symbol
Exploding bomb

Hazard category	Signal word	Hazard statement
Type A	Danger	H240 **Heating may cause an explosion**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.**- **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep/Store away from clothing/…/combustible materials.** ... Manufacturer/supplier or the competent authority to specify incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.		P411 + P235 **Store at temperatures not exceeding …°C/…°F. Keep cool.** ... Manufacturer/supplier or the competent authority to specify temperature. P410 **Protect from sunlight.** P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Organic peroxides

Symbol
Exploding bomb and flame

Hazard category	Signal word	Hazard statement
Type B	Danger	H241 **Heating may cause a fire or explosion**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep /Store away from clothing/.../combustible materials.** ... Manufacturer/supplier or the competent authority to specify incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.		P411 + P235 **Store at temperatures not exceeding …°C/…°F. Keep cool.** Manufacturer/supplier or the competent authority to specify temperature. P410 **Protect from sunlight.** P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Organic peroxides

Symbol
Flame

Hazard category	Signal word	Hazard statement	
Type C	Danger	H242	**Heating may cause a fire**
Type D	Danger	H242	**Heating may cause a fire**
Type E	Warning	H242	**Heating may cause a fire**
Type F	Warning	H242	**Heating may cause a fire**

Precautionary statements

Prevention	Response	Storage	Disposal
P210 **Keep away from heat/sparks/open flames/hot surfaces.** - **No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). P220 **Keep/Store away from clothing/.../ combustible materials** ... Manufacturer/supplier or the competent authority to specify incompatible materials. P234 **Keep only in original container.** P280 **Wear protective gloves/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.		P411 + P235 **Store at temperatures not exceeding …°C/…°F. Keep cool.** ... Manufacturer/supplier or the competent authority to specify temperature. P410 **Protect from sunlight.** P420 **Store away from other materials.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Note: Hazard category Type G: There are no label elements allocated to this hazard category

Corrosive to metals

Symbol
Corrosion

Hazard category	Signal word	Hazard statement
1	Warning	H290 **May be corrosive to metals**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P234 **Keep only in original container.**	P390 **Absorb spillage to prevent material damage.**	P406 **Store in corrosive resistant/... container with a resistant inner liner.** ... Manufacturer/supplier or the competent authority to specify other compatible materials.	

Acute toxicity – oral

Symbol
Skull and crossbones

Hazard category	Signal word	Hazard statement
1	Danger	H300 **Fatal if swallowed**
2	Danger	H300 **Fatal if swallowed**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P264 **Wash …thoroughly after handling.** … Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P301 + P310 **IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required*. P330 **Rinse mouth.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – oral

Symbol
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**
3	Danger	H301 **Toxic if swallowed**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P264 **Wash … thoroughly after handling.** … Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P301 + P310 **IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required*. P330 **Rinse mouth.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – oral

Symbol
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
4	Warning	H302 **Harmful if swallowed**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P301 + P312 **IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.** P330 **Rinse mouth.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – dermal

Symbol
Skull and crossbones

Hazard category	Signal word	Hazard statement
1	Danger	H310 **Fatal in contact with skin**
2	Danger	H310 **Fatal in contact with skin**

Precautionary statements

Prevention	Response	Storage	Disposal
P262 **Do not get in eyes, on skin, or on clothing.** P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.** P280 **Wear protective gloves/protective clothing.** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P350 **IF ON SKIN: Gently wash with plenty of soap and water**. P310 **Immediately call a POISON CENTRE or doctor/physician.** P322 **Specific measures (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate measures such as specific cleansing agent is advised*. P361 **Remove/Take off immediately all contaminated clothing.** P363 **Wash contaminated clothing before reuse.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – dermal

Symbol
Skull and crossbones

Hazard category	Signal word	Hazard statement	
3	Danger	H311 **Toxic in contact with skin**	

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P280 **Wear protective gloves/protective clothing.** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P352 **IF ON SKIN: Wash with plenty of soap and water.** P312 **Call a POISON CENTRE or doctor/physician if you feel unwell.** P322 **Specific measures (see ... on this label)** ... Reference to supplemental first aid instruction. *- if measures such as specific cleansing agent is advised.* P361 **Remove/Take off immediately all contaminated clothing.** P363 **Wash contaminated clothing before reuse.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – dermal

Symbol
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
4	Warning	H312 **Harmful in contact with skin**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P280 **Wear protective gloves/protective clothing** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P352 **IF ON SKIN: Wash with plenty of soap and water.** P312 **Call a POISON CENTER or doctor/physician if you feel unwell.** P322 **Specific measures (see ... on this label)** ... Reference to supplemental first aid instruction. - *if measures such as specific cleansing agent is advised.* P363 **Wash contaminated clothing before reuse.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – inhalation

Symbol
Skull and crossbones

Hazard category	**Signal word**	**Hazard statement**	
1	Danger	H330	**Fatal if inhaled**
2	Danger	H330	**Fatal if inhaled**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P271 **Use only outdoors or in a well-ventilated area.** P284 **Wear respiratory protection.** Manufacturer/supplier or the competent authority to specify equipment.	P304 + P340 **IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** P310 **Immediately call a POISON CENTER or doctor/physician.** P320 **Specific treatment is urgent (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate administration of antidote is required*.	P403 + P233 **Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile as to generate hazardous atmosphere.* P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – inhalation

Symbol
Skull and crossbones

Hazard category	Signal word	Hazard statement	
3	Danger	H331	**Toxic if inhaled**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P261 **Avoid breathing dust/fume/gas/mist/ vapours/spray**. Manufacturer/supplier or the competent authority to specify applicable conditions. P271 **Use only outdoors or in a well-ventilated area.**	P304 + P340 **IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** P311 **Call a POISON CENTER or doctor/physician.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate specific measures are required*.	P403 + P233 **Store in a well-ventilated place. Keep container tightly closed.** - *if product is volatile so as to generate hazardous atmosphere.* P405 **Store locked up.**	P501 **Dispose of contents/container to…** … in accordance with local/regional/national/international Regulations (to be specified).

Acute toxicity – inhalation

Symbol
Exclamation mark

Hazard category	Signal word	Hazard statement	
4	Warning	H332	**Harmful if inhaled**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P261 **Avoid breathing dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P271 **Use only outdoors or in a well-ventilated area.**	P304 + P340 **IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** P312 **Call a POISON CENTER or doctor/physician if you feel unwell.**		

Skin corrosion / irritation

Symbol
Corrosion

Hazard category	**Signal word**	**Hazard statement**
1A to 1C	Danger	H314 **Causes severe skin burns and eye damage**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dusts or mists.** *- if inhalable particles of dusts or mists may occur during use.* P264 **Wash …thoroughly after handling.** **…**Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P280 **Wear protective gloves/protective clothing/eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P301 + P330 + P331 **IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.** P303 + P361 + P353 **IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.** P363 **Wash contaminated clothing before reuse.** P304 + P340 **IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** P310 **Immediately call a POISON CENTER or doctor/physician.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. *- Manufacturer/supplier or the competent authority may specify a cleansing agent if appropriate.* P305 + P351 + P338 **IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Skin corrosion / irritation

Symbol
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**	
2	Warning	H315	**Causes skin irritation**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P264 **Wash … thoroughly after handling.** … Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P280 **Wear protective gloves.** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P352 **IF ON SKIN: Wash with plenty of soap and water**. P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. *- Manufacturer/supplier or the competent authority may specify a cleansing agent if appropriate.* P332 + P313 **If skin irritation occurs: Get medical advice/attention.** P362 **Take off contaminated clothing and wash before reuse.**		

Serious eye damage / irritation

Symbol
Corrosion

Hazard category	Signal word	Hazard statement
1	Danger	H318 **Causes serious eye damage**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P280 **Wear eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P305 + P351 + P338 **IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** P310 **Immediately call a POISON CENTER or doctor/physician.**		

Serious eye damage / irritation

Symbol
Exclamation mark

Hazard category	Signal word	Hazard statement
2A	Warning	H319 **Causes serious eye irritation**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P280 **Wear eye protection/face protection.** Manufacturer/supplier or the competent authority to specify type of equipment.	P305 + P351 + P338 **IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.** P337 + P313 **If eye irritation persists: Get medical advice/attention.**		

Sensitisation – respiratory

Symbol
Health hazard

Hazard category	Signal word	Hazard statement
1, 1A, 1B	Danger	H334 **May cause allergy or asthma symptoms or breathing difficulties if inhaled**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P261 **Avoid breathing dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P285 **In case of inadequate ventilation wear respiratory protection.** Manufacturer/supplier or the competent authority to specify equipment	P304 + P341 **IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.** P342 + P311 **If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Sensitisation – skin

Symbol
Exclamation mark

Hazard category	Signal word	Hazard statement
1, 1A, 1B	Warning	H317 **May cause an allergic skin reaction**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P261 **Avoid breathing dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P272 **Contaminated work clothing should not be allowed out of the workplace.** P280 **Wear protective gloves.** Manufacturer/supplier or the competent authority to specify type of equipment.	P302 + P352 **IF ON SKIN: Wash with plenty of soap and water**. P333 + P313 **If skin irritation or rash occurs: Get medical advice/attention.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *Manufacturer/supplier or the competent authority may specify a cleansing agent if appropriate.* P363 **Wash contaminated clothing before reuse.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Germ cell mutagenicity

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1A, 1B	Danger	H340 **May cause genetic defects** <...>
2	Warning	H341 **Suspected of causing genetic defects** <...>
		<...> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P201 **Obtain special instructions before use.** P202 **Do not handle until all safety precautions have been read and understood.** P281 **Use personal protective equipment as required.**	P308 + P313 **IF exposed or concerned: Get medical advice/attention.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Carcinogenicity

Hazard category	Signal word	Hazard statement
1A, 1B	Danger	H350 **May cause cancer** <...>
2	Warning	H351 **Suspected of causing cancer** <...> <...> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard).*

Symbol

Health hazard

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P201 **Obtain special instructions before use.** P202 **Do not handle until all safety precautions have been read and understood.** P281 **Use personal protective equipment as required.**	P308 + P313 **IF exposed or concerned: Get medical advice/attention.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Toxic to reproduction

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1A, 1B	Danger	H360 **May damage fertility or the unborn child** <...> <<...>>
2	Warning	H361 **Suspected of damaging fertility or the unborn child** <...> <<...>> <...> *(state specific effect if known)* <<...>> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P201 **Obtain special instructions before use.** P202 **Do not handle until all safety precautions have been read and understood.** P281 **Use personal protective equipment as required.**	P308 + P313 **IF exposed or concerned: Get medical advice/attention.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Toxic to reproduction

(effects on or via lactation)

Symbol
No symbol

Hazard category	**Signal word**	**Hazard statement**
(additional)	*No signal word*	H362 **May cause harm to breast-fed children**

Precautionary statements			
Prevention	**Response**	**Storage**	
P201 **Obtain special instructions before use.** P260 **Do not breathe dusts or mists.** - *if inhalable particles of dusts or mists may occur during use.* P263 **Avoid contact during pregnancy/while nursing.** P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P308 + P313 **IF exposed or concerned: Get medical advice/attention.**		

Specific target organ toxicity (single exposure)

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1	Danger	H370 **Causes damage to organs** <...> <<...>> <...> *(or state all organs affected if known)* <<...>> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P264 **Wash …thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P307 + P311 **IF exposed: Call a POISON CENTER or doctor/physician.** P321 **Specific treatment (see ... on this label)** ... Reference to supplemental first aid instruction. - *if immediate measures are required*.	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Specific target organ toxicity (single exposure)

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
2	Warning	H371 **May cause damage to organs** <...> <<...>> <...> *(or state all organs affected, if known)* <<...>> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P309 + P311 **IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Specific target organ toxicity (single exposure)

Symbol
Exclamation mark

Hazard category	**Signal word**	**Hazard statement**
3	Warning	H335 **May cause respiratory irritation;** or H336 **May cause drowsiness or dizziness**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P261 **Avoid breathing dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P271 **Use only outdoors or in a well-ventilated area.**	P304 + P340 **IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.** P312 **Call a POISON CENTER or doctor/physician if you feel unwell.**	P403 + P233 **Store in a well-ventilated place. Keep container tightly closed.** **-** *if product is volatile so as to generate hazardous atmosphere.* P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Specific target organ toxicity (repeated exposure)

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1	Danger	H372 **Causes damage to organs** <...> **through prolonged or repeated exposure** <<...>> <...> *(state all organs affected, if known)* <<...>> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. P264 **Wash … thoroughly after handling.** …Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling. P270 **Do not eat, drink or smoke when using this product.**	P314 **Get medical advice/attention if you feel unwell.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Specific target organ toxicity (repeated exposure)

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
2	Warning	H373 **May cause damage to organs** <...> **through prolonged or repeated exposure** <<...>> <...> *(state all organs affected, if known)* <<...>> *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)*

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
P260 **Do not breathe dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions.	P314 **Get medical advice/attention if you feel unwell.**		P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

ASPIRATION HAZARD

Symbol
Health hazard

Hazard category	**Signal word**	**Hazard statement**
1	Danger	H304 **May be fatal if swallowed and enters airways**

Precautionary statements			
Prevention	**Response**	**Storage**	**Disposal**
	P301 + P310 **IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.** P331 **Do NOT induce vomiting.**	P405 **Store locked up.**	P501 **Dispose of contents/container to...** ... in accordance with local/regional/national/international Regulations (to be specified).

Additional non-GHS hazard statements

A label must include any information about the hazards, first aid and emergency procedures relevant to the chemical, not otherwise included in the hazard statement and precautionary statements.

The following twelve non-GHS hazard statements should be used on labels of hazardous chemicals where applicable.

Physical hazard statements

AUH001: Explosive when dry

For explosive substances and mixtures placed on the market wetted with water or alcohols or diluted with other chemicals to suppress their explosives properties.

AUH006: Explosive with or without contact with air

For substances and mixtures that are unstable at ambient temperatures, for example acetylene.

AUH014: Reacts violently with water

For substances and mixtures that react violently with water, for example acetyl chloride, alkali metals and titanium tetrachloride.

AUH018: In use, may form flammable/explosive vapour-air mixture

For substances and mixtures not classified as flammable themselves but which may form flammable/explosive vapour-air mixtures. For substances this might be the case for halogenated hydrocarbons and for mixtures this might be the case due to a volatile flammable component or due to the loss of a volatile non-flammable component.

AUH019: May form explosive peroxides

For substances and mixtures that may form explosive peroxides during storage, for example diethyl ether, 1,4-dioxan.

AUH044: Risk of explosion if heated under confinement

For substances and mixtures not classified as explosive but which may nevertheless display explosive properties in practice if heated under sufficient confinement. In particular, substances and mixtures that decompose explosively if heated in a steel drum do not show this effect if heated in less-strong containers.

Human health hazard statements

AUH029: Contact with water liberates toxic gas

For substances and mixtures, when in contact with water or damp air, evolve gases classified for acute toxicity in Category 1, 2 or 3 in potentially dangerous amounts, for example aluminium phosphide, phosphorus pentasulphide.

AUH031: Contact with acids liberates toxic gas

For substances and mixtures that react with acids to evolve gases classified for acute toxicity in Category 3 in dangerous amounts, for example sodium hypochlorite and barium polysulphide.

AUH032: Contact with acids liberates very toxic gas

For substances and mixtures that react with acids to evolve gases classified for acute toxicity in Category 1 or 2 in dangerous amounts, for example salts of hydrogen cyanide, sodium azide.

AUH066: Repeated exposure may cause skin dryness or cracking

For substances and mixtures which may cause concern as a result of skin dryness, flaking or

cracking but which do not meet the criteria for skin irritancy.

AUH070: Toxic by eye contact

For substances or mixtures where an eye irritation test has resulted in overt signs of systemic toxicity or mortality among the animals tested, which is likely to be attributed to absorption of the substance or mixture through the mucous membranes of the eye. The statement should also be applied if there is evidence in humans for systemic toxicity after eye contact.

The statement should also be applied where a substance or a mixture contains another substance labelled for this effect, if the concentration of this substance is equal to, or greater than 0.1 %.

AUH071: Corrosive to the respiratory tract

For substances and mixtures in addition to classification for inhalation toxicity, if data is available that indicates the mechanism of toxicity was corrosivity.

In addition to an appropriate acute toxicity symbol, a ‘corrosion’ symbol (similar to the ‘corrosion’ symbol used for skin and eye corrosivity) is added along with the hazard statement AUH071: Corrosive to the respiratory tract.

For substances and mixtures in addition to classification for skin corrosivity, if no acute inhalation test data is available and which may be inhaled.

Appendix 1-F – Precedence rules of label elements

This appendix provides information on the rules of precedence of certain label elements, and general guidance for when redundant elements may be omitted from a label.

Duplication or redundancy of label elements may occur where a hazardous chemical meets the criteria for more than one hazard class or category. Duplication of an element may occur where:

- a specific precautionary statement applies to several hazard categories into which a particular chemical is classified
- an element may become redundant because a more stringent control applies to another hazard category (for example, the type of PPE required).

Duplicate or redundant information should not be included on a label.

Multiple hazards and precedence of hazard information

Hazard pictograms

The following rules apply for the use of hazard pictograms on a label:

- where a transport of dangerous goods class label (pictogram) is required on the container to meet transport regulations, the equivalent hazard pictogram, as specified in the GHS, should not appear
- if the skull and crossbones hazard pictogram applies, the exclamation mark hazard pictogram should not appear
- if the corrosive hazard pictogram applies, the exclamation mark hazard pictogram should not appear if it is used to communicate skin or eye irritation
- if the health hazard pictogram appears for respiratory sensitisation, the exclamation mark hazard pictogram should not appear if it is used to communicate skin sensitisation, or for skin or eye irritation.

Hazard statements

Where hazard statements are required to be present on a label, then all of the assigned hazard statements must appear on the label except where:

- the statement duplicates or conflicts with another statement or other hazard information that is required on the label
- omission of the statement would not decrease the level of protection or information in relation to the hazards.

Signal words

Where the signal word ‘Danger’ applies, the signal word ‘Warning’ should not appear concomitantly.

Precautionary statements

Where precautionary statements are required to be present on a label, then normally not more than six to ten precautionary statements are required, unless necessary to reflect the nature and the severity of the hazards. For example, precautionary statements can be omitted if:

- the statement duplicates or conflicts with another statement or other hazard information that is required on the label; and

- omission of the statement would not decrease the level of protection or information in relation to the hazards.

Any conflict that arises between precautionary statements that are present on labels may be resolved by modifying the statements. However, the new statement(s) must give equivalent levels of information or protection.

Note: It is not mandatory to include information relating to environmental hazard categories on the label of a workplace hazardous chemical. However, this information should be included if a fully GHS-compliant label is desired.

Example of where the omission of a precautionary statement is acceptable

An example where the omission of a precautionary statement on the label may be acceptable (and recommended) is where the use of personal protective equipment applies to different hazard categories for the same hazardous chemical.

For example, where the precautionary statements 'Wear face protection' and 'Wear gloves and face protection' are specified, then only the latter statement should appear on the label as it relates to the more stringent protective measures.

Example that illustrates how some of the precedence rules for elements should be applied on labels

In the following example, the chemical meets the criteria for flammable liquid (Category 2) and skin sensitisation (Category 1), as specified in the GHS.

The label that contains all of the elements required to meet the criteria for a substance or mixture that is classified as a flammable liquid (Category 2) and skin sensitiser (Category 1) is provided below. No precedence rules are applied:

	Flammable liquid (Category 2)	Skin sensitisation (Category 1)
Signal word	**Danger**	**Warning**
Hazard statement	**Highly flammable liquid and vapour**	**May cause an allergic skin reaction**
Hazard Pictogram		

Precautionary Statements	**- Keep away from heat/sparks/open flames/hot surfaces.– No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). **- Keep container tightly closed.** **- Ground/Bond container and receiving equipment** - *if electrostatically sensitive material is for reloading* - *if product is volatile* so *as to generate hazardous atmosphere.* **- Use explosion-proof electrical/ventilating/ lighting/.../equipment.** Manufacturer/supplier or the competent authority to specify other equipment. **- Use only non-sparking tools.** **Take precautionary measures against static discharge.** **- Wear protective gloves/eye protection/face protection** Manufacturer/supplier or the competent authority to specify type of equipment .**- IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing.** **- Rinse skin with water/shower.** **- In case of fire: Use ... for extinction.** Manufacturer/supplier or the competent authority to specify appropriate media *- if water increases risk.* **- Store in a well-ventilated place.** **- Keep cool.** **- Dispose of contents/container to** … In accordance with local requirements (to be specified).	**- Avoid breathing dust/fume/gas/mist/ vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. **- Contaminated work clothing should not be allowed out of the workplace.** **- Wear protective gloves.** Manufacturer/supplier or the competent authority to specify type of equipment. **- IF ON SKIN: Wash with plenty of soap and water**. **- If skin irritation or rash occurs: Get medical advice/attention.** **- Specific treatment (see ... on this label)** Reference to supplemental first aid instruction. *- Manufacturer/supplier or the competent authority may specify a cleansing agent if appropriate.* **- Wash contaminated clothing before reuse.** **- Dispose of contents/container to...** In accordance with local requirements (to be specified).

According to the precedence rules described above, the following elements should be omitted from the label:

- The signal word ‘Warning’ because ‘Danger’ applies.
- The precautionary statement ‘Wear protective gloves…’ because the statement ‘Wear protective gloves and eye protection/face protection…’ also applies, and therefore provides for more stringent PPE controls.

- The statement 'Dispose of contents/container to…' as this is duplicated and should only appear on the label once.

The following precautionary statements refer to similar controls and may be combined to aid comprehensibility and to save label space:

- IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing
- IF ON SKIN: Wash with plenty of soap and water

These statements could be combined to read:

- IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing and wash skin (or hair) with plenty of soap and water.

The label elements that apply to a flammable liquid (Category 2) and skin sensitiser (Category 1) with the precedence rules applied are:

Signal word	**Danger**
Hazard statement	**Highly flammable liquid and vapour** **May cause an allergic skin reaction**
Hazard Pictogram	
Precautionary Statements	**- Keep container tightly closed.** **- Keep away from heat/sparks/open flame/hot surfaces – No smoking.** Manufacturer/supplier or the competent authority to specify applicable ignition source(s). **- Ground/Bond container and receiving equipment.** *- if electrostatically sensitive material is for reloading.* *- if product is as volatile as to generate hazardous atmosphere:* **- Use explosion-proof electrical/ventilating/lighting/…/equipment.** Manufacturer/supplier or the competent authority to specify other equipment. **- Use only non-sparking tools.** **- Take precautionary measures against static discharge.** **- Wear protective gloves and eye protection/face protection** Manufacturer/supplier or the competent authority to specify type of equipment. **- Avoid breathing dust/fume/gas/mist/vapours/spray.** Manufacturer/supplier or the competent authority to specify applicable conditions. **- Contaminated work clothing should not be allowed out of the workplace.**

	- In case of fire: Use ... for extinction. Manufacturer/supplier or the competent authority to specify appropriate media.. *- if water increases risk.* **- IF ON SKIN (or hair) Remove/take off immediately all contaminated clothing and wash skin (or hair) with plenty of soap and water.** **- Rinse skin with water/shower.** **- If skin irritation or rash occurs: Get medical advice/attention.** **- Wash contaminated clothing before re-use.** **- Specific treatment (see … on this label)** …Reference to supplemental first aid instruction – *Manufacturer/supplier or the competent authority may specify a cleansing agent if appropriate.* **- Store in a well-ventilated place.** **- Keep cool.** **- Dispose of contents/container to** …in accordance with local/regional/national/international Regulations (to be specified).

Appendix 1-G – Hazard pictograms

The nine hazard pictograms that are representative of the physical, health and/or environmental hazards are shown below:

Pictogram	**Hazard**
	- Explosive
Exploding bomb	
	- Flammability
Flame	

Pictogram	**Hazard**
	- Gases under pressure
Gas cylinder	
	- Corrosive
Corrosion	

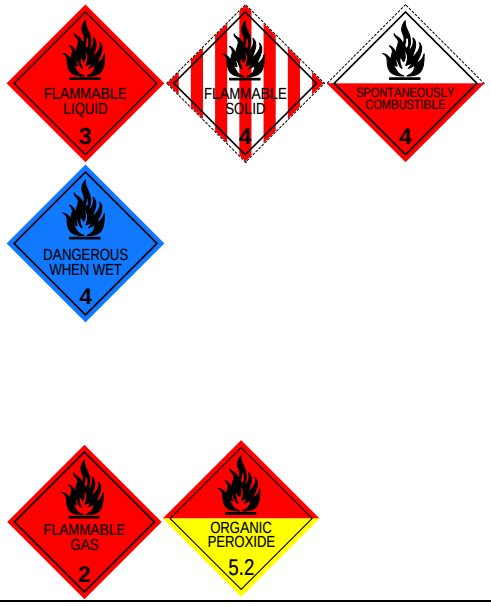
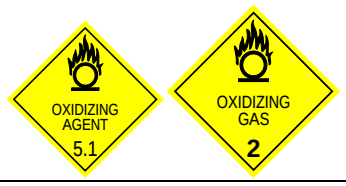
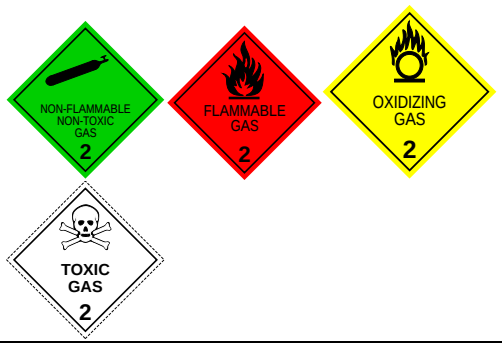
	- Oxidising
Flame over circle	
	- Chronic Health hazards
Health hazard	
	- Environmental hazard
Environment	

	- Acute toxicity
Skull and crossbones	
	- Certain health Hazards (e.g. sensitisers)
Exclamation mark	

Chronic health hazards include carcinogens, reproductive toxins, mutagens, specific target organ toxicants, and aspiration toxicants.

Appendix 1-H – Comparison of hazard pictograms with ADG code class labels

The table below compares hazard pictograms from the GHS with the corresponding ADG Code class labels.

Hazard Pictograms	GHS Hazard	Dangerous Goods class labels (pictograms)	Dangerous goods classes
	Explosives Self-reactives Organic peroxides		Explosive
	Flammables Self-reactives Pyrophorics Self-heating Emits flammable gas in contact with water Organic peroxides		• Flammability (Liquid, Solid or Gas) • Pyrophoric, • Emits Flammable Gas • Organic Peroxide
	Oxidisers		• Oxidiser • Oxidising gas
	Gases under pressure		Non-toxic non-flammable gas, flammable gas, oxidising gas, toxic gas
	Acute toxicity		• Acute toxicity • Acute Toxic gas

	Acute toxicity Skin irritants Eye irritants Skin sensitisers	No equivalent	
	Carcinogens Respiratory sensitisers Reproductive toxicants Target organ toxicants Germ cell mutagens	No equivalent	
	Eye corrosion Skin corrosion Corrosive to metal		Corrosive to metals
	Aquatic toxicity. Not covered within the scope of workplace hazardous chemicals requirements		Environmental hazard
No equivalent hazard pictogram			Miscellaneous dangerous goods
Not covered within the scope of workplace hazardous chemicals requirements			Infectious
Not covered within the scope of workplace hazardous chemicals requirements			Radioactive

Appendix 1-I – Example labels

This appendix contains example labels that have been produced in accordance with the labelling system described in this Recognised Standard (in some cases they have been reduced in size for the purpose of presenting in this document). Examples 1-4 are prepared for a hypothetical hazardous mixture, *Flammosol*. *Flammosol* contains 95% aliphatic hydrocarbons and 5% toxicole and is classified as
a flammable liquid (Category 2), acute toxicity – oral (Category 3) and skin corrosion/irritation (Category 2).

Note: it is assumed that toxicole is an acceptable technical name.

Example 1: *Flammosol* label containing the full set of workplace labelling information

The general precautionary statements 'Read label before use' and 'Keep out of reach of children' have been included. Inclusion of these statements is not mandatory. In accordance with precedence rules described in Appendix 1-E, the exclamation mark hazard pictogram and 'Warning' signal word have been omitted and duplicate precautionary statements have not been included.

Read label before use. Keep out of reach of children

Flammosol

FLAMMABLE LIQUID, TOXIC N.O.S.

(aliphatic hydrocarbons, toxicole)

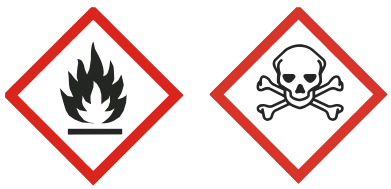
UN 1992

Contains:

Aliphatic hydrocarbons 95%

Toxicole 5%

4 L



DANGER

Highly flammable liquid and vapour

Toxic if swallowed

Causes skin irritation

IF ON SKIN (or hair): Take off contaminated clothing and wash before re-use.

Rinse skin using plenty of soap and water.

If skin irritation occurs: Get medical advice/attention.

IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.

Rinse mouth.

In case of fire: Use powder for extinction.

Keep away from sparks and open flames. – No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical equipment.

	Use only non-sparking tools. Take precautionary measures against static discharge.
Store locked up in a well-ventilated place. Keep cool.	Wear protective gloves and eye and face protection. Wash hands thoroughly after handling.
Dispose of contents/container in accordance with Jurisdictional regulations. Refer to the Safety Data Sheet before use.	Do not eat, drink or smoke when using this product.
Madeup Chemical Company, 999 Chemical Street, Chemical Town, My State. Telephone: 1300 000 000 www.madeup-chemical-company.com.au	

Example 2: *Flammosol* label containing the full set of workplace labelling information using 2 separate panels

Front panel

Read label before use. Keep out of reach of children

Flammosol

FLAMMABLE LIQUID, TOXIC N.O.S.

(aliphatic hydrocarbons, toxicole)

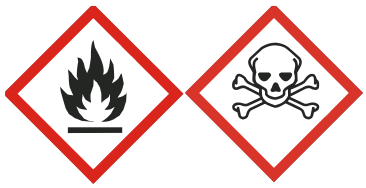
UN 1992

Contains:

Aliphatic hydrocarbons 95%

Toxicole 5%

4 L



DANGER

Highly flammable liquid and vapour

Toxic if swallowed

Causes skin irritation

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www.madeup-chemical-company.com.au

Back panel

IF ON SKIN (or hair): Take off contaminated clothing and wash before re-use.
Rinse skin using plenty of soap and water.
If skin irritation occurs: Get medical advice/attention.
IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.
Rinse mouth.

In case of fire: Use powder for extinction.
Keep away from sparks and open flames. – No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves and eye and face protection.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.

Store locked up in a well-ventilated place. Keep cool.

Dispose of contents/container in accordance with Jurisdictional Regulations.

Refer to the Safety Data Sheet before use.

Example 3: *Flammosol* label that meets both transport and workplace labelling requirements (single container)

The equivalent dangerous goods (transport) classification for *Flammosol* is a class 3 (flammable liquid, packing group II) and a class 6.1 (oral toxicity, packing group III). The transport markings should be in the most prominent position on the container and should be clearly distinguishable from the workplace labelling. Hazard pictograms are not included on the workplace label panel as the equivalent class labels appear on the transport panel.

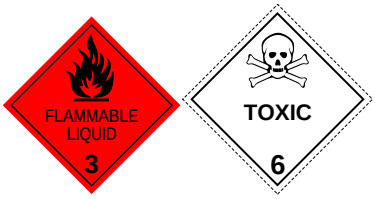
Transport markings label portion (to comply with transport Regulations)

Flammosol

FLAMMABLE LIQUID, TOXIC N.O.S.

(aliphatic hydrocarbons, toxicole)

UN 1992



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Workplace information label panel:

Flammosol

Contains:

Aliphatic hydrocarbon 95%

Toxicole 5%

DANGER

Highly flammable liquid and vapour

Toxic if swallowed

Causes skin irritation

4 L

IF ON SKIN (or hair): Take off contaminated clothing and wash before re-use.
Rinse skin using plenty of soap and water.
If skin irritation occurs: Get medical advice/attention.
IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician. Rinse mouth

In case of fire: Use powder for extinction.
Keep away from sparks and open flames. – No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves and eye and face protection.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.

Store locked up in a well-ventilated place. Keep cool.

Dispose of contents/container in accordance with Jurisdictional Regulations.

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Telephone: 1300 000 000 www.madeup-chemical-company.com.au

Example 4: *Flammosol* labels that are appropriate for small containers

The amount of information included on the label of a small container will vary, and be dependent on the size and shape of the container; and the number of label elements to be included, particularly where the hazardous chemical meets the criteria for multiple hazard classes. As a mandatory minimum, small containers must be labelled with the product identifier, manufacturer or importer information and hazard pictograms or hazard statements. Labels for small containers or packages must include as much labelling information as reasonably practicable

a) This example contains the minimum labelling information permitted and a reference to the safety data sheet.

Flammosol

Refer to the Safety Data Sheet before use.

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Chemical Town, My State.

Telephone: 1300 000 000

b) This label has sufficient room to include additional labelling information. Following the guidance provided in Appendix 1-E, hazard statements, the identity and proportions of the hazardous ingredients, critical first aid instructions and reference to the safety data sheet have been included.

Flammosol

Contains:	**Highly flammable liquid and vapour**
Hydrocarbon solvent 95%	**Toxic if swallowed**
Toxicole 5%	**Causes skin irritation**

IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.

Rinse mouth.

Additional information is listed in the Safety Data Sheet

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Example 5: Example labels for hazardous waste

a) Hazardous Waste label that meets both transport and workplace labelling requirements (single container)

Selected precautionary statements relating to first aid instructions, accident prevention and personal protective equipment and disposal advice have been included. Hazard pictograms have not been included as the corresponding transport class labels already appear. The generic type of waste solvent is expected to be known e.g.alcohols, esters, ketones, aliphatic hydrocarbons, aromatic hydrocarbons or chlorinated hydrocarbons.

Flammable Toxic Waste - Batch 1

FLAMMABLE LIQUID, TOXIC N.O.S.

(hydrocarbons, organotin compound)

UN 1992

Contains

Mixed aromatic and aliphatic hydrocarbons (90%)

Alkyl tin (5%)

Flammable liquid and vapour

Toxic if swallowed

IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.

Keep away from ignitions sources. – No smoking.

In case of fire: Use powder for extinction.

Wear protective gloves, eye and face protection.

Dispose of contents in accordance with Jurisdictional Regulations

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My State. Telephone: 1300 000 000

www.madeup-chemical-company.com.au

b) Hazardous Waste label that meets workplace labelling requirements and transport inner packaging requirements

The main differences between this and the previous example are that hazard pictograms are used and the proper shipping name and UN number are not included.

Flammable Toxic Waste – Batch 1

Contains

Mixed aromatic and aliphatic hydrocarbons (90%)

Alkyl tin (5%)

Flammable liquid and vapour

Toxic if swallowed

IF SWALLOWED: Immediately call a POISON CENTRE or doctor/physician.

Keep away from ignitions sources. – No smoking.

In case of fire: Use powder for extinction.

Wear protective gloves, eye and face protection.

Dispose of contents in accordance with Jurisdictional Regulations

Madeup Chemical Company, 999 Chemical Street, Chemical Town, My State.
Telephone: 1300 000 000

www.madeup-chemical-company.com.au

c) Labelling of hydrochloric acid waste that meets workplace labelling requirements and transport inner packaging requirements

Hydrochloric acid waste

May be corrosive to metals
Causes serious eye damage

Wear eye/face protection

IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do so. Continue rinsing.

Immediately call a POISON CENTRE or doctor/physician.

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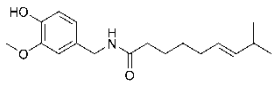
www.madeup-chemical-company.com.au

Example 6: Example labels for research chemicals or samples for analysis

a) In this example, the chemical identity and some of the hazardous properties are known, and are therefore, included on the label.

A.B. Researcher

Aromatic amide



WARNING

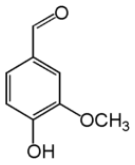
Causes serious eye irritation

Causes skin irritation

b) In this example, the identity of the chemical is known. However, the hazardous properties have not been determined.

A.B. Researcher

Phenolic aldehyde



CAUTION

Unknown properties

Note: For examples 6(a) and 6(b), a generic name in accordance with Appendix 1-D *should* be used, as chemical structures are difficult to communicate in the event of an incident.

c) In the following example, neither the identity nor the hazardous properties of the substance are known.

ABR14b

(Uncharacterised substance)

CAUTION

Unknown properties

Example 7: Example labels for a substance not otherwise classifiable under the GHS.

The following two example labels are for carbon dioxide (dry ice). Dry ice does not meet any of the hazard categories of the GHS, and therefore cannot be assigned any label elements. However there are health and safety issues associated with the handling, use and storage of dry ice and information on these hazards should be included on labels.

a) The following label meets road transport labelling requirements. It also meets workplace labelling requirements as it includes other health and safety information that are applicable to its workplace storage, handling and use.

CARBON DIOXIDE, SOLID (dry ice)

UN 1845

2.5 kg net

Asphyxiation hazard:

Use only in well ventilated area

Wear gloves and eye protection

Madeup Chemical Company, 999 Chemical Street,

Chemical Town, My State. Telephone: 1300 000 000

b) The following label meets workplace labelling requirements and road transport inner packaging requirements. No hazard pictograms or class labels are present. However,

health and safety information relating to storage, handling and use in the workplace is included.

Dry Ice (solid CO_2)

2 kg net

Asphyxiation hazard:

Use only in well ventilated area

Wear gloves and eye protection

Madeup Chemical Company, 999 Chemical Street,

Chemical Town, My State. Telephone: 1300 000 000

Appendix 2-A – Placard and manifest quantities

Table B.1

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Item	**Description of hazardous chemical**		**Placard quantity**	**Manifest quantity**	**DG Placard to display**
1	Flammable gases	Category 1	200L	5000L	
2	Gases under pressure	With acute toxicity, categories 1, 2, 3 or 4	50L	500L	
3		With skin corrosion categories 1A, 1B or 1C	50L	500L	
4		Aerosols	5000L	10 000L	
5		Not specified elsewhere in this Table	1000L	10 000L	 or 
6	Flammable liquids	Category 1	50L	500L	
7		Category 2	250L	2500L	
8		Category 3	1000L	10 000L	
9		Any combination of chemicals from Items 6 to 8 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000L	10 000L	
10		Category 4	10 000L	100 000L	**COMBUSTIBLE LIQUID**
11	Self-reactive substances	Type A	5kg or 5L	50kg or 50L	
12		Type B	50kg or 50L	500kg or 500L	
13		Type C to F	250kg or 250L	2500kg or 2500L	
14	Flammable solids	Category 1	250kg	2500kg	
15		Category 2	1000kg	10 000kg	

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Item	**Description of hazardous chemical**		**Placard quantity**	**Manifest quantity**	**DG Placard to display**
16		Any combination of chemicals from Items 12 to 15 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
17	Pyrophoric liquids and pyrophoric solids	Category 1	50kg or 50L	500kg or 500L	
18	Self-heating substances and mixtures	Category 1	250kg or 250L	2500kg or 2500L	
19		Category 2	1000kg or 1000L	10 000kg or 10 000L	
20		Any combination of chemicals from Items 17 to 19 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
21	Substances which in contact with water emit flammable gas	Category 1	50kg or 50L	500kg or 500L	
22		Category 2	250kg or 250L	2500kg or 2500L	
23		Category 3	1000kg or 1000L	10 000kg or 10 000L	
24		Any combination of chemicals from Items 21 to 23 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
25	Oxidising liquids and oxidising solids	Category 1	50kg or 50L	500kg or 500L	
26		Category 2	250kg or 250L	2500kg or 2500L	
27		Category 3	1000kg or 1000L	10 000kg or 10 000L	
28		Any combination of chemicals from Items 25 to 27 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
29	Organic peroxides	Type A	5kg or 5L	50kg or 50L	
30		Type B	50kg or 50L	500kg or 500L	
31		Type C to F	250kg or 250L	2500kg or 2500L	

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Item	**Description of hazardous chemical**		**Placard quantity**	**Manifest quantity**	**DG Placard to display**
32		Any combination of chemicals from Items 30 and 31 where none of the items exceeds the quantities in columns 4 or 5 on their own	250kg or 250L	2500kg or 2500L	
33	Acute toxicity	Category 1	50kg or 50L	500kg or 500L	
34		Category 2	250kg or 250L	2500kg or 2500L	
35		Category 3	1000kg or 1000L	10 000kg or 10 000L	
36		Any combination of chemicals from Items 33 to 35 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
37	Skin corrosion	Category 1A	50kg or 50L	500kg or 500L	
38		Category 1B	250kg or 250L	2500kg or 2500L	
39		Category 1C	1000kg or 1000L	10 000kg or 10 000L	
40	Corrosive to metals	Category 1	1000kg or 1000L	10 000kg or 10 000L	
41		Any combination of chemicals from Items 37 to 40 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
42	Unstable explosives		5kg or 5L	50kg or 50L	
43	Unstable chemicals	Any combination of chemicals from items 11, 29 and 42 where none of the items exceeds the quantities in columns 4 or 5 on their own	5kg or 5L	50kg or 50L	
Notes 1 In item 2, Gases under pressure with acute toxicity, category 4 only applies up to a LC50 of 5000 ppmV. This is equivalent to dangerous goods of Division 2.3. 2 Item 4 includes flammable aerosols.					

Determination of classification of flammable liquids

For the purposes of this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4

had the same classification as the flammable liquid in the spill compound with the lowest flash point.

Example

For placarding and manifest purposes, a spill compound containing 1000L of flammable liquid category 1 and 1000L of flammable liquid category 4 is considered to contain 2000L of flammable liquid category 1

Appendix 3-A – Header checklist

This checklist provides a summary of the information contained in section 11 of Part 3 of this Recognised Standard. It is not a comprehensive list of information required on the SDS. Refer to the relevant section for detailed instructions.

Section	Headers
1. Product identifier & identity for the chemical	☐ Product Identifier ☐ Other means of identification ☐ Recommended use of the chemical and restrictions on use ☐ Suppliers name, address and phone number ☐ Emergency phone number
2. Hazard Identification	☐ Classification of the hazardous chemical ☐ Label elements, including precautionary statements ☐ Other hazards which do not result in classification
3. Composition/information on ingredients	☐ Identity of chemical ingredients ☐ CAS number and other unique identifiers ☐ Concentration of ingredients
4. First Aid Measures	☐ Description of necessary first aid measures ☐ Symptoms caused by exposure ☐ Medical Attention and Special Treatment
5. Fire Fighting Measures	☐ Suitable extinguishing media ☐ Specific hazards arising from the chemical ☐ Special protective equipment and precautions for fire fighters
6. Accidental release measures	☐ Personal precautions, protective equipment and 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	☐ Control parameters – exposure standards, biological monitoring ☐ Appropriate engineering controls ☐ Personal protective equipment (PPE)
9. Physical and chemical properties	☐ Appearance ☐ Odour ☐ Odour threshold ☐ pH ☐ Melting point/freezing point ☐ Boiling point and boiling range ☐ Flash point ☐ Evaporation rate

Section	Headers
	☐ Flammability ☐ Upper/lower flammability or explosive limits ☐ Vapour pressure ☐ Vapour density ☐ Relative density ☐ Solubility(ies) ☐ Partition coefficient: n-octanol/water ☐ Auto-ignition temperature ☐ Decomposition temperature ☐ Viscosity ☐ Specific heat value ☐ Particle size ☐ Volatile organic compounds content ☐ % volatile ☐ Saturated vapour concentration ☐ Release of invisible flammable vapours and gases
Additional parameters	☐ Shape and aspect ratio ☐ Crystallinity ☐ Dustiness ☐ Surface area ☐ Degree of aggregation or agglomeration ☐ Ionisation (redox potential) ☐ Biodurability or biopersistence
10. Stability and Reactivity	☐ Reactivity ☐ Chemical stability ☐ Conditions to avoid ☐ Incompatible materials and possible hazardous reactions ☐ Hazardous decomposition products
11. Toxicological information	☐ Information on routes of exposure ☐ Symptoms related to exposure ☐ Numerical measures of toxicity ☐ Immediate, delayed and chronic health effects from exposure ☐ Exposure Levels ☐ Interactive effects ☐ Data limitations
12. Ecological information	☐ Ecotoxicity ☐ Persistence and degradability ☐ Bioaccumulative potential ☐ Mobility in soil

Section	Headers
	☐ Other adverse effects
13. Disposal considerations	☐ Safe handling and disposal methods ☐ Disposal of any contaminated packaging ☐ Environmental regulations
14. Transport information	☐ UN number ☐ Proper shipping name ☐ Transport hazard class(es) ☐ Packing group ☐ Environmental hazards ☐ Special precautions during transport ☐ Hazchem Code
15. Regulatory information	☐ Safety, health and environmental regulations specific for the product in question ☐ Poisons Schedule number
16. Other information	☐ Date of preparation or review ☐ Key abbreviations or acronyms used

Appendix 3-B – Disclosure proportions of ingredients in safety data sheets

This requirement applies if an ingredient in a hazardous chemical causes the correct classification of the chemical to include a hazard class and hazard category referred to in table C.1.

The identity of the ingredient must be disclosed in English on the label and safety data sheet of the hazardous chemical.

Table C.1

Column 1 Item	Column 2 GHS hazard class	Column 3 GHS hazard category
1	Acute toxicity—oral	Category 1
		Category 2
		Category 3
		Category 4
2	Acute toxicity—dermal	Category 1
		Category 2
		Category 3
		Category 4
3	Acute toxicity—inhalation	Category 1
		Category 2
		Category 3
		Category 4
4	Respiratory sensitiser	Category 1
5	Skin sensitiser	Category 1
6	Mutagenicity	Category 1A
		Category 1B
		Category 2
7	Carcinogenicity	Category 1A
		Category 1B
		Category 2
8	Toxic to reproduction	Category 1A
		Category 1B
		Category 2
		Additional category for effects on or via lactation
9	Target organ toxicity—single exposure	Category 1
		Category 2
		Category 3
10		Category 1

Column 1 Item	Column 2 GHS hazard class	Column 3 GHS hazard category
	Target organ toxicity—repeat exposure	Category 2
11	Aspiration hazards	Category 1
12	Skin corrosion or irritation	Category 1A
		Category 1B
		Category 1C
		Category 2
13	Serious eye damage or eye irritation	Category 1
		Category 2A

Generic names used to disclose identity of ingredients

The ingredient:

(a) may be disclosed by its generic name if:

(i) the ingredient causes the correct classification of the hazardous chemical to include a hazard class and hazard category referred to in table C.2; and

(ii) the ingredient does not cause the correct classification of the hazardous chemical to include any other hazard class and hazard category in table C.1; and

(iii) the identity of the ingredient is commercially confidential; and

(iv) an exposure standard for the ingredient has not been established; or

(b) in any other case—must be disclosed by its chemical identity.

Table C.2

Column 1 Item	Column 2 Hazard class and hazard category
1	Acute toxicity (category 4)
2	Aspiration hazard (category 1)
3	Serious eye damage or eye irritation (category 2A)
4	Skin corrosion or irritation (category 2)
5	Specific target organ toxicity (single exposure) (category 3)

Disclosing proportions of ingredients

The proportion of the ingredient to the hazardous chemical must be disclosed:

(a) if the exact proportion of the ingredient is not commercially confidential—as the exact proportion of the chemical, expressed as a percentage by weight or volume; or

(b) if the exact proportion of the ingredient is commercially confidential—as 1 of the following ranges within which the exact proportion fits, expressed as a percentage by weight or volume:

(i) <10%;

(ii) 10 – 30%;

(iii) 30 – 60%;

(iv) > 60%;

(v) a range that is narrower than the range set out in subparagraph (i), (ii), (iii) or (iv).

Appendix 3-C – GHS label elements for inclusion in the SDS

The information in this Appendix guides the selection of appropriate GHS signal words, pictograms, hazard statements and precautionary statements that apply to each GHS hazard class and category. It includes elements for all categories of precautionary action. All specific elements relating to particular hazard classes and categories should be used. General elements not linked in particular to a certain hazard class or category should also be used, where appropriate.

The precautionary statements included in the following matrix cover general emergency response and first-aid. For some specific chemicals, supplementary first aid, treatment measures or specific antidotes or cleansing materials may be required. Poisons Centres and/or medical practitioners or specialist advice should be sought in such situations and included on labels where appropriate.

C1. Structure of hazard statement text

The text in bold should appear in the SDS, except as otherwise specified. The information in italics should also appear as part of the hazard statement in the SDS when the information is known, for example:

> **"Causes damage to organs** *(or state all organs affected, if known)* **through prolonged or repeated exposure** *(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)".*

The hazard statement codes shown in the tables are intended to be used for reference purposes only. They are not part of the hazard statement text and should not be used to replace it in the SDS.

C2. Structure of precautionary statement text

There are five types of precautionary statements: **general, prevention**, **response** (in case of accidental spillage or exposure, emergency response and first aid), **storage** and **disposal**.

The core parts of the precautionary statements are shown in bold print. This is the text that should appear in the SDS, except as otherwise specified.

The precautionary statement codes used in the tables are intended to be used for reference purposes only. They are not part of the precautionary statement text and should not be used to replace it in the SDS.

To provide flexibility in the application of precautionary phrases, a combination of statements may be used to improve the readability of phrases. Combinations of phrases can also be useful for different types of hazard where the precautionary behaviour is similar. For example:

"Keep away from heat, sparks and open flame and store in a cool well ventilated place".

Where precautionary statements have been modified or combined, clear plain language is essential to convey information on precautionary behaviour.

When a backslash or diagonal mark [/] appears in a precautionary statement text, it indicates that a choice has to be made between the phrases they separate. For example, in P280 "**Wear protective gloves/protective clothing/eye protection/face protection**" could read "**Wear eye protection**" where the hazard classification does not warrant the additional personal protective equipment.

When three full stops [**…**] appear in a precautionary statement text, they indicate that all applicable conditions are not listed. For example, in P241 "**Use explosion-proof electrical/ventilating/lighting/.../equipment."**, the use of "**...**" indicates that other equipment should be specified.

When *text in italics* is used in the precautionary statement text, this indicates specific conditions apply to the use or allocation of the precautionary statement. This may relate to conditions attaching to either the general use of a precautionary statement or its use for a particular hazard class and/or hazard category. For example, for P241 "**Use explosion-proof electrical/ventilating/lighting/.../ equipment**" only applies for flammable solids "*if dust clouds can occur".*

C3. General precautionary measures

The general precautionary statements listed below are not aligned with any particular GHS hazard category. According to the GHS principles, these statements are required for consumer products only. However, manufacturers of hazardous chemicals may choose to include these in an SDS, particularly where it is foreseeable that the chemical may be used in a non-workplace situation.

Code (1)	General precautionary statements (2)	Conditions for use (5)
P101	**If medical advice is needed, have product container or label at hand.**	Consumer products
P102	**Keep out of reach of children.**	Consumer products
P103	**Read label before use.**	Consumer products

C4. Tables of label elements from the GHS

The tables in ***APPENDIX 1-E*** provide the following information for each hazard class and hazard category of the GHS:

- hazard category
- the assigned GHS symbol
- the assigned signal word
- the assigned hazard statement and code
- the assigned precautionary statements, by precautionary statement type and code.

Appendix 3-D – Other relevant information

- ADG Code, class labels and publication information

  www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/

- Model Code of Practice: *Preparation of Safety Data Sheets*

  www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/safety-data-sheets-hazardous-chemicals-cop

- GHS hazard pictograms for download

  www.unece.org/trans/danger/publi/ghs/pictograms.html

- GHS revision 3 – Official text and corrigenda:

  www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html

- Labelling codes for Agricultural and Veterinary chemicals
  - apvma.gov.au/registrations-and-permits/labelling-codes
- SUSMP publication information

  www.tga.gov.au/industry/scheduling-poisons-standard.htm

- UN Model Regulations for the Transport of Dangerous Goods

  www.unece.org/trans/danger/danger.html

Hazard Classification

- Australian Inventory of Chemical Substances (AICS) (NICNAS) www.nicnas.gov.au/regulation-and-compliance/aics
- Chemical Assessment Reports (NICNAS) www.nicnas.gov.au/chemical-information
- Exposure Standards (Workplace Exposure Standards for Airborne Contaminants)
- https://www.safeworkaustralia.gov.au/exposure-standards
- Globally Harmonized System of Classification and Labelling of Chemicals (GHS) (United Nations) http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html
- Global Portal to Information on Chemical Substances (OECD[16]) www.echemportal.org
- HSIS database http://hsis.safeworkaustralia.gov.au/
- Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (ECHA[17]) http://echa.europa.eu/reach_en.asp

[16] OECD means the Organisation for Economic Co-operation and Development

[17] ECHA means European Chemicals Agency

Standards, applicable to all, or several, classes of hazardous chemicals	
AS 1319:1994	Safety Signs for the Occupational Environment
AS 1345:1995	Rules for the identification of piping, conduits and ducts
AS/NZS 3833:2007	The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers
AS 4745:2004	Code of practice for handling combustible dusts
AS 4897:2008	The design, installation and operation of underground petroleum storage systems
AS 4976:2008	The removal and disposal of underground petroleum storage tanks
AS 4977:2008	Petroleum products – Pipeline, road tanker compartment and underground tank identification
AS/NZS 60079.10.1:2009	Classification of areas – Explosive gas atmospheres (IEC 6007-10-1, Ed. 1.1 (2008) MOD)
AS/NZS 61241.10:2005	Electrical apparatus for use in the presence of combustible dust - Classification of areas where combustible dusts are or may be present
HB 76:201	Dangerous goods – Initial emergency response guide

Dangerous goods or specific types of dangerous goods within a class	
Gases (in particular DG class 2.1, 2.2 and 2.3)	
AS 1375:1985	Industrial fuel fire appliances
AS/NZS 1596:2008	Storage and handling of LP Gas
AS/NZS 4645.2:2008	Gas distribution networks - Steel pipe systems
AS 1894:1997	The storage and handling of non-flammable cryogenic and refrigerated liquids
AS/NZS 2022:2003	Anhydrous Ammonia – Storage and handling
AS 2030.1:2009	Gas cylinders – General requirements
AS 2030.2:1996	The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases – Cylinders for dissolved acetylene
AS 2030.4:1985	The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases – Welded steel cylinders, insulated
AS 2337.1:2004	Gas cylinder test stations - General requirements, inspection and tests - Gas cylinders
AS 2658:2008	LP gas – portable and mobile appliances
AS 2896:2011	Medical gas systems – Installation and testing of non-flammable medical gas pipeline systems
AS/NZS 2927:2001	The storage and handling of liquefied chlorine gas
AS 3814:2009	Industrial and commercial gas fired appliances
AS 3961:2005	Liquefied natural gas – storage and handling
AS 4289:1995	Oxygen and acetylene gas reticulation systems
AS 4332:2004	The storage and handling of gases in cylinders
AS 5601.1:2010	Gas installations
Flammable liquids (in particular DG class 3)	
AS 1940:2004	The storage and handling of flammable and combustible liquids
AS 1692:2006	Steel tanks for flammable and combustible liquids
AS/NZS 2106 set	Methods for the determination of the flashpoint of flammable liquids (closed cup)
AS/NZS 2906:2001	Fuel Containers – Portable – plastics and metal
Flammable solids, self-reactive substances, pyrophoric liquids and solids, self-heating substances and substances which in contact with water emit flammable gases (in particular DG class 4.1, 4.2, and 4.3)	
AS/NZS 4745:2004	Code of practice for handling combustible dusts
Oxidising liquids and solids, organic peroxides (in particular DG class 5.1 and 5.2)	
AS 2714:2008	The storage and handling of hazardous chemical materials – Class 5.2 substances (organic peroxides)
AS 4326:2008	The storage and handling of oxidising substances
Toxic substances (in particular DG class 6.1)	

Dangerous goods or specific types of dangerous goods within a class	
AS/NZS 4081:2001	The storage, handling and transport of liquid and liquefied polyfunctional isocyanates
AS/NZS 4452:1997	The storage and handling of toxic substances
Corrosive substances (in particular DG class 8)	
AS 3780:2008	The storage and handling of corrosive substances
Miscellaneous substances (in particular DG class 9)	
AS/NZS 4681:2000	The storage and handling of class 9 (miscellaneous) dangerous goods

Design requirements	
AS 1530.4:2005	Methods for fire tests on building materials, components and structures – Fire resistance tests of elements of building construction
AS 1668.2:2001	The use of ventilation and air-conditioning in buildings - Ventilation design for indoor air contaminant control
AS/NZS 1680 set	Interior lighting
AS 2809: 2008 set	Road tank vehicles for dangerous goods
AS/NZS 2885 set	Pipelines – gas and liquid petroleum
AS 3788: 2006	Pressure equipment – In-service inspection
AS 3873:2001	Pressure equipment – Operation and maintenance
AS 3892:2001	Pressure equipment – Installation

Fire protection	
General	
AS/NZS 1221:1997	Fire hose reels
AS 1603 part 1-17	Automatic fire detection and alarm systems
AS 1670 part 1-6	Fire detection, warning, control and intercom systems – System design, installation and commissioning
AS 1851 Set:2005	Maintenance of fire protection equipment
AS 2118 part 1-9	Automatic fire sprinkler installations
AS 2419 part 1-3	Fire hydrant installations
AS 2441:2005	Installation of fire hose reels
AS 2941:2008	Fixed fire protection installations – Pump set systems
Fire prevention	
AS/NZS 1020:1995	Control of undesirable static electricity
AS/NZS 1768:2007	Lightning protection
AS 2359.12:1996	Powered industrial trucks – Hazardous areas
Fire Extinguishers	
AS/NZS 1841 Set: 2007	Portable fire extinguishers

AS/NZS 1850:2009	Portable fire extinguishers – Classification, rating and performance testing
AS 2444:2001	Portable fire extinguishers and fire blankets – Selection and location
AS 4265:1995	Wheeled fire extinguishers

Industry or particular situation	
AS 2243 part 1-10	Safety in laboratories
AS 2507:1998	The storage and handling of agricultural and veterinary chemicals
AS/NZS 2865:2009	Safe working in a confined space
AS/NZS 2982: 2010	Laboratory design and construction
AS 3846:2005	The handling and transport of dangerous cargoes in port areas
AS 4041:2006	Pressure piping
AS/NZS 4114.1 2003	Spray painting booths – design, construction and testing

Personal protective equipment (PPE)	
AS/NZS 1336:1997	Recommended practices for occupational eye protection
AS/NZS 1337 part 1-6	Eye protectors for industrial applications
AS/NZS 1715:2009	Selection, use and maintenance of respiratory protective devices
AS/NZS 1716:2003	Respiratory protective devices
AS/NZS 2161 Set: 2008	Occupational protective gloves
AS/NZS 2210.1:2010	Safety, protective and occupational footwear - Guide to selection, care and use
AS/NZS 2210.2:2009	Occupational protective footwear - Test methods
AS/NZS 4503 part 1-3	Protective clothing - Protection against liquid chemicals - Test method: Resistance of materials to permeation by liquids

Airborne contaminants - sampling and analysis	
AS 2985:2009	Workplace atmospheres – Method for sampling and gravimetric determination of respirable dust
AS 2986.1:2003	Workplace air quality – Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography – Pumped sampling method
AS 2986.2:2003	Workplace air quality – Sampling and analysis of volatile organic compounds by solvent desorption/gas chromatography – Diffusive sampling method
AS 3640:2009	Workplace atmospheres – Method for sampling and gravimetric determination of inhalable dust
AS 3853.1:2006	Health and safety in welding and allied processes – Sampling of airborne particles and gases in the operator's breathing zone – Sampling of airborne particles
AS 3853.2:2006	Health and safety in welding and allied processed – Sampling of airborne particles and gases in the operator's breathing zone – Sampling of gases

Health and Safety Executive (UK)	Monitoring strategies for toxic substances, Environmental Hygiene, No.42 Methods for the determination of hazardous chemicals, MDHS Series
National Institute for Occupational Safety and Health (USA)	NIOSH manual of analytical methods Occupational exposure sampling strategy manual