

How to Read a Safety Data Sheet (SDS)

The required content and format of safety data sheets in New Zealand are defined in the Hazardous Substances (Safety Data Sheets) Notice 2017

Who is responsible for providing an SDS and ensuring it is NZ HSNO compliant?

A supplier who supplies any quantity of a hazardous substance to a workplace must provide a SDS complainant with the Hazardous Substances (Safety Data Sheets) Notice 2017 when:

- the hazardous substance is first supplied to the workplace and,
- if the safety data sheet for the hazardous substance is amended or,
- upon request if the supplier has supplied the hazardous substance to any person in the past 5 years.

What does an SDS need to be fully HSNO compliant?

SDS's must include the date it was prepared and, if it has been amended, the date it was last reviewed along with information under each of the following headings:

- I. Identification
- II. Hazard identification
- III. Composition and information on ingredients
- IV. First-aid measures
- V. Fire-fighting measures
- VI. Accidental release measures
- VII. Handling and storage
- VIII. Exposure controls / personal protection
- IX. Physical and chemical properties
- X. Stability and reactivity
- XI. Toxicological information
- XII. Ecological information
- XIII. Disposal considerations
- XIV. Transport information
- XV. Regulatory information
- XVI. Other information

Each section should contain the following information:

Section I - Identification

- a. A product identifier that clearly identifies the hazardous substance,
- b. recommended uses and any restrictions on use or supply,
- c. enough information to enable the New Zealand manufacturer or importer to be contacted. However, for substances imported from overseas directly into a workplace for use (not for resale or supply), the name and contact details of the overseas supplier can be provided in place of the New Zealand importer,
- d. in the case of a class 1, class 5, class 6.1, 6.3, 6.4, 6.5, class 8.2, or 8.3 substance, a 24-hour freephone emergency contact phone number; and
- e. in the case of a hazardous substance not referred to in paragraph (d), a freephone emergency contact phone number and the hours of availability, if these are restricted.

Section II - Hazard identification

The GHS or HSNO classification and hazard information including the GHS signal word, GHS hazard statements and GHS precautionary statements in relation to relevant hazard properties. The percentage concentration of each substance in a mixture may also be listed.

Section III - Composition and information on ingredients

- a. In the case of a single ingredient, the chemical identity, including common names and synonyms, CAS number and any impurities and stabilising additives that are themselves hazardous and which contribute to the classification of the substance.
- b. In the case of hazardous substances that are mixtures, as for a single ingredient as well as the proportion of the mixture that they comprise.

NB: Chemicals are often known by different names:

- A trade name, such as "Safety Clean", is the brand name the manufacturer gives the product. It does not tell you, however, what chemicals are in the product, or whether the product is a mixture of chemicals or a single chemical. The same chemical may be used in a variety of products with different trade names. The trade name usually appears on the label and in Section I of the MSDS.
- A generic name describes a family or group of chemicals. For example, there are several different "isocyanates", and thousands of different "chlorinated hydrocarbons".
- The chemical or specific name is the one that describes the specific chemical. An example is methyl chloroform, one of the thousands of "chlorinated hydrocarbons", or toluene diisocyanate, a member of the "isocyanate" family. **The chemical name is the easiest name to use when doing research on the health effects of chemicals and how to protect yourself.**
- The CAS Number is a number given by the Chemical Abstract Service to each chemical. While different chemicals may have the same name, they will all have their own CAS number which can be used to look up information.

Section IV – First aid measures

- a. First aid instructions according to each relevant route of exposure; and
- b. Whether medical attention is required, and its urgency; and
- c. Information on the most important symptoms and effects, acute and delayed, from exposure.

Section V - Fire-fighting measures

- a. Information on the appropriate type of extinguishers or fire-fighting agents, and
- b. Any advice on specific hazards that may arise from the substance, including the nature of combustion products;
- c. Special protective equipment and precautions for fire-fighters.

- **Extinguishing media:** This section should specify what kind of fire extinguisher to use. There are four classifications of fires: Class A for paper and wood, Class B for more flammable materials such as liquids or greases, Class C for electrical fires, and Class D for fires involving metals or metal alloys.
- **Special firefighting procedures and unusual fire and explosion hazards:** For example, some chemicals (such as corrosives) must not be extinguished with water in case of fire.

Section VI - Accidental release measures

- a. Personal precautions, protective equipment, and emergency procedures
- b. Any environmental precautions from accidental spills and release
- c. Advice on how to contain and clean up a spill or release.

Section VII - Handling and storage




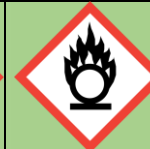



- Precautions for safe handling
- Conditions for safe storage, including any incompatibilities

When considering where to store a hazardous substance pay special attention to any incompatibilities e.g. Pyrrolidine falls within the following HSNO classes: 3.1B|8.1A|6.1C (oral)|6.1D (inhalation)|8.2B|8.3A|6.9A|9.1C

A full SDS such as the Gold SDS produced by Chemwatch will tell you should:

- Avoid oxidising agents, acids, acid chlorides, acid anhydrides, chloroformates.
- Avoid contact with copper, aluminium and their alloys.

While a mini SDS (from Chemwatch), tells you in broad terms which classes Pyrrolidine may or may not be stored with i.e.

						
Flammable	Explosive	Acute toxic	Oxidiser	Chronic Toxic	Toxic	Corrosive
+	x	+	x	+	+	+

x	— Must not be stored together
0	— May be stored together with specific preventions
+	— May be stored together

As a class 3.1 flammable liquid pyrrolidine should be stored in a flammables cabinet.

However, Pyrrolidine is also a class 8.2B corrosive base and according to [Schedule 15](#) of the Health and Safety at Work Hazardous Substances Regulations (2017) 8.2B corrosive bases are incompatible with 8.2B corrosive acids (see appendix 5).

Therefore, it is essential that you know the contents of any flammables cabinet before adding the pyrrolidone. For example if propionic acid (HSNO classes 3.1C|6.1C (dermal)|6.1D (oral)|**8.2B**|8.3A) was already present in a flammables cabinet then pyrrolidone could not be added.

Section VIII - Exposure controls/personal protection

- Occupational exposure
- Engineering controls
- Identification of the specific types of personal protective equipment needed to minimise the potential for illness or injury due to exposure to the substance

Control measures that can reduce or eliminate the hazard, including ventilation and other engineering controls, safe work practices, and personal protective equipment.

For respirators, information on the type of respirator, degree of protection and the appropriate filter cartridge (such as acid gases, dust or organic vapours). In addition, all gloves do not protect against all chemicals. The correct type of glove should be specified on the MSDS.

Section IX - Physical and chemical properties

- a. Appearance (physical state, colour, etc.)
- b. Odour
- c. odour threshold
- d. pH
- e. melting point/freezing point
- f. initial boiling point and boiling range
- g. flash point
- h. flammability (solid, gas)
- i. upper/lower flammability or explosive limits
- j. vapour pressure
- k. vapour density
- l. relative density
- m. solubility (ies)
- n. partition coefficient n-o:ctanol/water
- o. auto-ignition temperature
- p. decomposition temperature
- q. kinematic viscosity

if specific properties do not apply, the property must still be listed on the safety data sheet with a statement that the property does not apply.

- **Appearance and odour:** This information may help identify a substance that spills or leaks in your work area. However, many chemicals are hazardous at levels lower than they can be smelled. Also, many chemicals, such as hydrogen sulfide and ammonia, cause "olfactory fatigue", which means that workers rapidly lose their ability to smell the substance.
- **Boiling point:** The boiling point of a substance is the temperature at which the liquid boils or becomes a gas. The lower the boiling point, the quicker it evaporates and the easier it is to inhale. Chemicals with boiling points below 100C require special caution.
- **Flash point:** This is the lowest temperature at which a liquid gives off enough vapor to form a mixture with air that can be ignited by a spark. Liquids with flash points below 38CF are considered flammable, and liquids with flash points between 38C and 100C are considered to be combustible. Flammable and combustible liquids require special handling and storage precautions.
- **Vapor pressure:** A high vapor pressure indicates that a liquid will evaporate easily. Chemicals which evaporate quickly are called volatile. This means that air concentrations can build up quickly, even though the substance is in liquid form. Liquids with high vapor pressures may be especially hazardous if you are working with them in a confined space or an enclosed area.
- **Vapor density:** If the vapor density is less than one, it will tend to rise in air. If the vapor density is greater than one, it will fall in air and concentrate in the bottom of tanks or confined spaces.
- **Relative density:** If the specific gravity is greater than one, the substance will sink in water; if less than one, it will float on top of water.

Section X - Stability and reactivity

- a. An indication of the chemical reactivity and chemical stability of the substance under normal storage and handling conditions
- b. A list of conditions to avoid or prevent a hazardous situation
- c. information on incompatible substances or materials
- d. Information on hazardous decomposition products.

When stored improperly, some chemicals can react with other chemicals and release dangerous materials. This describes the reaction of chemicals when they are mixed together with other chemicals, or when stored or handled improperly.

Section XI - Toxicological information

- a. Toxicological information should be provided for the following hazardous properties:
 - i. acute toxicity (6.1A, 6.1B, 6.1C, 6.1D)
 - ii. aspiration hazard (6.1E (aspiration hazard))
 - iii. respiratory irritation (6.1E (respiratory irritant))
 - iv. skin corrosion/irritation (8.2A, 8.2B, 8.2C, 6.3A)
 - v. serious eye damage/irritation (8.3A, 6.4A)
 - vi. respiratory or skin sensitisation (6.5A, 6.5B)
 - vii. germ cell mutagenicity (6.6A, 6.6B)
 - viii. carcinogenicity (6.7A, 6.7B)
 - ix. reproductive toxicity (6.8A, 6.8B, 6.8C)
 - x. specific organ toxicity (repeated and single exposure) (6.9A, 6.9B)
 - xi. narcotic effects (6.9B).

- b. The toxicological information that must be provided is:
 - i. a full description of the toxicological (health) effects, including the symptoms or signs of injury or ill health associated with each likely route of exposure, including delayed and immediate effects and also chronic effects from short and long-term exposure
 - ii. the dose, concentration or conditions of exposure likely to cause injury or ill health
 - iii. a summary of the data used to identify the health effects.

Section XII - Ecological information

- a. ecotoxicity (aquatic and terrestrial)
- b. persistence and degradability
- c. the potential to be bio accumulative
- d. mobility in soil
- e. other adverse effects

Section XIII - Disposal considerations

- a. Appropriate disposal methods, including disposal of packaging
- b. special precautions to be taken during disposal
- c. any method of disposal that should not be used.

Section XIV - Transport information

If applicable,—

- a. the UN number
- b. the UN proper shipping name
- c. the UN dangerous goods class and subsidiary risk
- d. the UN Packing Group
- e. environmental hazards (e.g. Marine Pollutant)
- f. special precautions when transporting the substance.

Section XV -: Regulatory information

- a. HSNO approval number and, if applicable, the relevant group standard title
- b. reference to any applicable tolerable exposure limit or environmental exposure limit
- c. reference to relevant regulatory requirements not provided elsewhere in the safety data sheet, including:
 - i. certified handler, tracking and controlled substance licence requirements under the Health and Safety at Work Act 2015
 - ii. whether the Agricultural Compounds and Veterinary Medicines Act 1997 applies to the substance
 - iii. whether the substance is covered by international agreements such as the Montreal Protocol, the Stockholm Convention or Rotterdam Convention.

Section XVI - Other information

- a. Date of preparation or review of the safety data sheet
- b. a key or legend to abbreviations and acronyms used

Sources:

Hazardous Substances (Safety Data Sheets) Notice 2017

Appendices – Substance incompatibilities in accordance with the Health and Safety at Work Hazardous Substances Regulations (2017)

Appendix 1 - Substances and materials incompatible with class 2, and 3 substances:

Hazard classification	Incompatible substances and materials
2.1.1	All class 1 substances Class 2.1.2 substances All class 3 substances All class 4 substances All class 5 substances
2.1.2	All class 1 substances Class 2.1.1 substances All class 3 substances All class 4 substances All class 5 substances
3.1	All class 1 substances All class 2 substances Class 3.2 substances All class 4 substances All class 5 substances
3.2	All class 1 substances All class 2 substances Class 3.1 substances Class 4.1.2, 4.2, and 4.3 substances All class 5 substances

Appendix 2 - Substances and materials incompatible with class 4 substances

Hazard classification	Incompatible substances and materials
4.1.1 (readily combustible solids)	All class 1 substances All class 2 substances Class 4.1.2, 4.1.3, 4.2, and 4.3 substances All class 5 substances
4.1.1 (those solids that may cause fire through friction only)	Any substance likely to cause a spark when struck against such a class 4.1.1 substance
4.1.2	All class 1 substances All class 2 substances Class 3.1 and 3.2 substances Class 4.1.3 and 4.2 substances All class 5 substances Catalytic impurities that have a detrimental influence on the thermal stability and the hazard presented by class 4.1.2 substances
4.1.3	All class 1 substances All class 2 substances Class 3.1 substances Class 4.2 substances All class 5 substances
4.2	All class 1 substances All class 2 substances All class 3 substances Class 4.1.1, 4.1.2, 4.1.3, and 4.3 substances All class 5 substances Air Oxygen
4.3	All class 1 substances All class 2 substances All class 3 substances Class 4.1.1, 4.1.2, 4.1.3, and 4.2 substances All class 5 substances All class 8 substances Water

Appendix 3 - Substances and materials incompatible with class 5 substances

Incompatible, in relation to a class 5.1.1 or 5.1.2 substance means,—

- (a) a substance or material that is not compatible with the class 5.1.1 or 5.1.2 substance; and
- (b) includes—
 - (i) a substance that is not a class 5.1.1 or 5.1.2 substance but that is classified in class 5.2, or in any of classes 1, 2, 3, 4, 6.1A, 6.1B, 6.1C, or 8:
 - (ii) any organic matter, or substance that contains carbon, in a form that will combust with the class 5.1.1 or 5.1.2 substance:
 - (iii) zinc or magnesium in any form, and any other metal in powdered form:
 - (iv) any substance or material that will combust with air, or will combust with or catalyse the decomposition of a class 5.1.1 or 5.1.2 substance

Appendix 4 - Substances and materials incompatible with class 6 substances

Hazard classification	Incompatible substances and materials
6.1A, 6.1B, 6.1C	All class 1 substances All class 5 substances
6.1A, 6.1B, 6.1C (toxic cyanides)	All class 1 substances All class 5 substances All class 8.2 substances corrosive acids

Appendix 5 - Substances and materials incompatible with class 8 substances

Hazard classification	Incompatible substances and materials
8.2A and 8.2B corrosive acids	All class 1 substances Class 4.3A, 4.3B, 4.3C substances All class 5 substances Class 6.1A, 6.1B, 6.1C substances toxic cyanides Class 8.2A and 8.2B substances corrosive alkalis
8.2A and 8.2B corrosive alkali	All class 1 substances Class 4.3A, 4.3B, 4.3C substances All class 5 substances Class 8.2A and 8.2B substances corrosive acids