



National Code of Practice
for the Preparation of
Material Safety Data Sheets
2nd Edition
[NOHSC:2011(2003)]



April 2003

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National codes of practice declared by NOHSC under s.38(1) of the *National Occupational Health and Safety Commission Act 1985* (Cwlth) are documents prepared for the purpose of advising employers and workers of acceptable preventive action for averting occupational deaths, injuries and diseases in relation to workplace hazards.

The expectation of the Commonwealth Government and NOHSC is that national codes of practice will be suitable for adoption by Commonwealth, State and Territory governments. Such action will increase uniformity in the regulation of occupational health and safety throughout Australia and contribute to the enhanced efficiency of the Australian economy.

It should be noted that NOHSC documents are instruments of an advisory character, except where a law, other than the National Occupational Health and Safety Commission Act 1985, or an instrument made under such a law, makes them mandatory. The application of any NOHSC document in any particular State or Territory is the prerogative of that State or Territory.

FOREWORD

In seeking to achieve Australian workplaces free from injury and disease, NOHSC works to lead and coordinate national efforts to prevent workplace death, injury and disease. We seek to achieve our mission through the quality and relevance of information we provide and to influence the activities of all parties with roles in improving Australia's occupational health and safety (OHS) performance.

In seeking to improve Australia's OHS performance, NOHSC works to:

- support and add value to efforts in the jurisdictions to tailor approaches to prevention improvement;
- facilitate, through strategic alliances, the development and implementation of better approaches to achieving improved prevention outcomes; and
- integrate the needs of small business into its work.

On 24 May 2002, the Workplace Relations Ministers' Council endorsed the release of the NOHSC National OHS Strategy 2002-2012. The strategy was developed by the members of NOHSC and reflects their agreement to share responsibility for continuously improving Australia's performance in work related health and safety.

There are five initial national priority areas for action to achieve short term and longer term improvements. The priorities are:

- reduce high incidence/severity risks;
- improve the capacity of business operators and workers to manage OHS effectively;
- prevent occupational disease more effectively;
- eliminate hazards at the design stage; and
- strengthen the capacity of government to influence OHS outcomes.

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PREFACE

The Material Safety Data Sheet (MSDS) is a document that describes the chemical and physical properties of a material and provides advice on safe handling and use of the material. The term Safety Data Sheet (SDS) is also commonly used overseas to describe such a document.

Within the workplace, the MSDS is a recognised information source, which underpins the overall risk management program to control exposure to hazardous and dangerous materials. The advice contained on the MSDS includes information on health effects, exposure control, safe handling and storage, emergency procedures, and disposal. For most workplace risk assessments required by Commonwealth, State and Territory legislation, the MSDS and the label are the main information sources. The MSDS may also be used as an integral component of any workplace training system.

This code of practice provides guidance on the preparation of an MSDS under the workplace hazardous substances and Dangerous Goods regulatory framework. Under this framework a supplier must produce MSDS for all hazardous substances and/or Dangerous Goods. Compliance with this code will ensure the MSDS is prepared in accordance with the recommended formats in Australia.

Under Commonwealth, State and Territory legislation, employers must obtain an MSDS for all hazardous substances and/or Dangerous Goods supplied to or used in the workplace, and ensure they are available to all employees. It is also the duty of the employer to assess the risks to health and safety created by work involving potential exposure to any hazardous substance and/or Dangerous Goods. This assessment involves identifying and gathering information on hazardous substances and/or Dangerous Goods used at work, where the primary source of this information is the MSDS and the label.

The declaration of the *National Standard for the Storage and Handling of Workplace Dangerous Goods* [NOHSC:1015(2001)] in 2001, led to the development of the *National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition* [NOHSC:2011(2003)] (MSDS code) in order to incorporate the information provisions of the Dangerous Goods standard. This has also provided an opportunity to further align Australian requirements with recent international developments such as the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS). The GHS incorporates the use of a 16 header MSDS format. The adoption of the GHS will lead to the gradual introduction of acceptable overseas MSDS and allow Australian exporters to provide acceptable information to overseas markets. Safety Data Sheet is a term used in the GHS. Along with other GHS terminology, Australia is moving towards the adoption of terms such as Safety Data Sheet as part of its alignment with international developments.

Since 1994, the NOHSC MSDS code has acknowledged the use of two formats for the MSDS in Australia, the original NOHSC 8 header format, and the 16 header format adopted by the European Union and the International Labour Organization. The Second Edition of the code provides guidance on the preparation of a 16 header MSDS, which is consistent with the information requirements of the globally harmonised format.

The National Occupational Health and Safety Commission agreed to declare the *National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition* [NOHSC:2011(2003)] on 24 April 2003, with a 3-year transitional period. The new requirements relating to the preparation of Material Safety Data Sheets, as detailed in Chapter 6 of this code, therefore should come into effect in Commonwealth, State and Territory regulations on and from 24 April 2006.

1 TITLE

This national code of practice may be cited as the *National Code of Practice for the Preparation of Material Safety Data Sheets 2nd Edition* [NOHSC:2011(2003)].

2 PURPOSE

The purpose of this code of practice is to provide advice on the preparation of Material Safety Data Sheets (MSDS) where required by legislation. The aim is to provide consistent health and safety advice to persons who could be exposed to hazardous substances and Dangerous Goods.

3 SCOPE AND APPLICATION

(a) This code of practice applies to materials classified as:

- (i) hazardous substances; and
- (ii) Dangerous Goods.

(b) This Code of Practice does not apply to Dangerous Goods that are:

- (i) Class 1-Explosives;
- (ii) Class 6.2-Infectious Substances;
- (iii) Class 7-Radioactive Material; and
- (iv) C1 combustible liquids that do not fall within the definition of a hazardous substance.

Provision of Hazard Information

While an MSDS is not required for substances not classified as hazardous, there's often a legislative requirement to provide hazard information. It is good practice to provide a MSDS for any material, which may give rise to a health, safety or environmental effect. The most convenient and established way of providing this information is through an MSDS.

4 DEFINITIONS

The following definitions are terms referred to in the text of this code of practice.

ADG Code

Australian Code for the Transport of Dangerous Goods by Road and Rail.

Allergic reaction

means an over-reaction by the immune system to an antigen. It can take the form of a rash, asthma, breathing difficulties, weeping eyes or sneezing.

Antidote

means a treatment for chemical over-exposure, which is specific (more or less) to the chemical or class of chemicals, in contrast to supportive treatment, which maintains body functions.

Appearance

means a description of the physical state of the material.

Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

means the code prepared by the National Road Transport Commission in conjunction with the Advisory Committee on the Transport of Dangerous Goods (ACTDG) and the Federal Office of Road Safety which was endorsed by the Australian Transport Council. Many of the technical requirements of the ADG Code are based on provisions of the United Nations Recommendations on the Transport of Dangerous Goods. The ADG Code covers the classification, packaging, marking, labelling and transport of Dangerous Goods (Classes 2-9). It comprises of the *Australian Code for the Transport of Dangerous Goods by Road and Rail*, the *Rail (Dangerous Goods) Rules* and the *Road Transport Reform (Dangerous Goods) Regulations*.

Australian Standard (AS)

means a standard published by Standards Australia or jointly published with Standards New Zealand.

BAT

means an equivalent to a biological limit value set by the German *Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area*.

Biological limit value

means limit values for the level of substances in biological samples such as blood or urine.

Boiling point

means the temperature at which the vapour pressure of a substance equals the atmospheric or other designated pressure.

Cancer

means a malignant tumour which can spread to other organs of the body. As distinct from a benign tumour which cannot (although leukemia and some other malignant diseases are not solid tumours, they meet other criteria for cancer and can be, and often are, included under this definition).

Carcinogen

means an agent which is responsible for the formation of a cancer.

Carcinogenic

means capable of causing cancer.

CAS Number or CAS No. (Chemical Abstracts Service Registry Number)

means a unique number assigned by the Chemical Abstracts Service, Columbus, Ohio, USA.

Chemical

means any element or compound present as an entity or contained in a mixture.

Classification

means the process whereby the toxicological, physicochemical and ecotoxicological properties of a material are identified and categorised.

Combustion

means the process of burning.

Combustible liquid

means those liquids within the meaning of Australian Standard *AS 1940 The storage and handling of flammable and combustible liquids*; see also 'flammable'.

Commercially confidential information

means information, such as chemical identity or exact composition, which, if made public, would significantly damage commercial interests.

Composite material

means a material that contains a mixture of two or more types of fundamentally different components.

Concentration cut-off level

means the concentration level in the National Occupational Health and Safety Commission's *List of Designated Hazardous Substances* [NOHSC:10005], or assigned in accordance with the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008].

Corrosive

means having a pH of 2.0 or less or a pH greater than 11.5 causing the destruction of, or damage to, materials or living tissue on contact; and/or meets the criteria of corrosive under the ADG Code.

Corrosive substance

means a material which has been classified as a corrosive according to the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008] and/or as defined under the ADG Code.

Dangerous Goods

means those goods that:

- (a) are named in a specific entry in Column 2 in Appendix 2 of the ADG Code, but not in a generic entry or in an entry where the letters 'N.O.S' are shown as part of the Proper Shipping Name for the goods; or
- (b) satisfy the criteria in Column 2 or 9 in Appendix 2 of the ADG Code; or
- (c) satisfy the criteria in a Special Provision of the ADG Code that is applied by Column 7 in Appendix 2 of the ADG Code; or

- (d) are determined to be Dangerous Goods by the authority appointed by the jurisdiction to give effect to the ADG Code; or
- (e) satisfy the United Nations Dangerous Goods tests and criteria for determining whether goods are Dangerous Goods; or
- (f) include goods defined as goods too dangerous to transported; or
- (g) include C1 combustible liquids.

Density

means the ratio of mass of a material to its volume. It is measured at 25°C (unless otherwise stated) and expressed in grams per cubic centimetre (g/cm³) or kilograms per cubic metre (kg/m³).

Dermatitis

means an inflammation of the skin. Irritant contact dermatitis is direct damage to the skin, which is due to contact with the irritant substance, for example, acids, alkalis or organic solvents in sufficient concentration and for sufficient time. It occurs soon after exposure and persists long after exposure has ceased. Allergic contact dermatitis is an inflammatory reaction caused by substances, which penetrate the skin and cause a specific allergic response (sensitisation) after a variable lag period ranging from a matter of days to several months. Once sensitisation has occurred, exposure to only a relatively small quantity of the substance will trigger a reaction within 48-96 hours due to developed hypersensitivity of the body.

Dose

means the amount of test substance administered. Dose is expressed as mass (grams or milligrams) or as mass of test substance per unit mass of test animal (e.g. milligrams per kilogram body mass), or as constant dietary concentrations (milligrams per kilogram of food).

Employee

means an individual who works under a contract of employment, apprenticeship or traineeship.

Emergency services authority

means an organisation with functional jurisdiction over emergency response as defined by a State, Territory or Commonwealth jurisdiction.

Employee representative

includes an employee member of a health and safety committee where established in the workplace, or a person elected to represent a group of employees on health and safety matters.

Employer

means a corporation or an individual who employs persons under a contract of employment, apprenticeship or traineeship.

Note: The definition of employer includes the self-employed which means a person who works for gain, other than under a contract of employment, apprenticeship or traineeship, whether or not that person employs others.

Epidemiological

means relating to the study of the relationships determining the frequency and distribution of disease in a human community.

Evaporation

means the change of state from a liquid to a gas.

Explosive limits

has the same meaning as flammable limits (q.v.).

Exposure standard

means an airborne concentration of a particular substance in a person's breathing zone, as established by the National Occupational Health and Safety Commission's *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003].

Flammability

means the conditions under which a material will burn.

Flammable

means being capable of being ignited and burning in air; see also 'flammable liquid' and 'combustible liquid'.

Flammable limits

means the range of concentrations of a flammable vapour in air at which a flame can be propagated or an explosion will occur, if a sufficient source of ignition is present. Normally expressed as upper and lower limits of this range, as a percentage of the volume of vapour in air. The term 'explosive limits' has the same meaning as 'flammable limits'. Has the same meaning as explosive limits (q.v.).

Flammable liquid

means a liquid which is capable of being ignited and burning in air and which meets the criteria of the ADG Code (liquids with a flashpoint of not more than 60.5°C closed-cup test, or not more than 65.6°C open-cup test).

Generic name

means a name applied to describe a category or group of chemicals. Examples of generic names are azo dyes and halogenated aromatic amines.

Hazard

means an intrinsic capacity associated with a material or process capable of causing harm.

Hazardous substance

means a substance which:

- (a) is listed on the National Occupational Health and Safety Commission's List of Designated Hazardous Substances [NOHSC:10005]; or
- (b) has been classified as a hazardous substance in accordance with the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008].

Hazchem Code

means an emergency action code of numbers and letters which gives information to emergency services. Its use is required by the ADG Code for Dangerous Goods in bulk.

Health effects criteria

means the basis on which a substance is evaluated with respect to its toxicological data.

Identification

means providing information on the name of a product, some of its other names, its use, properties and chemical composition found in sections 1 and 2 of the MSDS.

Ignition

means setting fire to or being set fire to.

Ignition temperature

means the minimum temperature required to start or cause self-sustained combustion in any substance in the absence of a high temperature ignition source, such as a spark or a flame.

Incompatibility

means a situation where any substance or residue, which by combining chemically with the incompatible substances or promoting self-reaction or decomposition of the incompatible substances, may create a hazard; or in accordance with regulation 2.6 of the *Rail (Dangerous Goods) Rules* and regulation 2.6 of the *Road Transport Reform (Dangerous Goods) Regulations*.

Information, Additional

means information that may be useful for the users of the MSDS. Such information should be provided if relevant and available.

Information, Core

means information essential to understanding the hazards of the material. It also allows MSDS prepared in accordance with this code of practice to be consistent with the information requirements of overseas systems. This information should always be included in the MSDS.

Ingredient

means any component of a substance.

Inhalation

means breathing in.

Interaction

means modification of toxic effects of one substance by another. The effects can be amplified (synergism) or reduced (antagonism).

Irritant

means a substance that will produce local irritation or inflammation on contact with tissues and membranes, such as skin or eyes, or that will, after inhalation, produce local irritation or inflammation of nasal or lung tissue.

Label

means a set of information on a container which identifies the substance in the container, identifies whether the substance is hazardous and provides basic information about the safe use and handling of the substance. For Dangerous Goods, label means one or more of the following:

- a class label;
- a subsidiary risk label; or
- a mixed class label.

MAK

means an equivalent to an exposure standard set by the German *Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area*.

Material Safety Data Sheet (MSDS)

means a document that describes the properties and uses of a material, that is, identity, chemical and physical properties, health hazard information, precautions for use and safe handling information.

May

means that a recommendation is optional.

Melting point

means the temperature at which a substance changes from solid to liquid, normally measured in °C.

Metabolism

means the process(es) by which the administered substances are structurally changed in the body either by enzymatic or non-enzymatic reactions.

Mixture

means a physical combination of ingredients resulting from the deliberate mixing of those ingredients; or a chemical reaction of ingredients that may form more than one new compound or have unreacted ingredients still present.

mm Hg

means millimetres of mercury (Hg). This is a unit of pressure (760 mm Hg = 101.325 kPa).

Mutagenic

means able to produce a mutation.

National Exposure Standard

means an airborne concentration of a particular material in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers. The exposure standard can be of three forms: time-weighted average (TWA); peak limitation; or short term exposure limit (STEL).

Oral

means ingested or administered via the mouth.

Packing Group, as defined by the ADG Code

means the division of Dangerous Goods of Classes 3, 4, 5, 6.1, 8 and some Class 9 into three groups according to the degree of hazard they present: 'I' (great danger), 'II' (medium danger) and 'III' (minor danger).

pH

means a value representing how acidic or alkaline a solution is. Acids have a pH of less than 7. The lower the pH, the stronger the acid (normal minimum 0). Alkalis have a pH greater than 7. The higher the pH the stronger the alkali [(normal maximum 14) (0.01 M hydrochloric acid has a pH of 2. 0.01 M sodium hydroxide has a pH of 12. 0.1 M acetic acid, a weak acid, has a pH of 3 and 0.1 M ammonium hydroxide, a weak alkali, has a pH of 11)].

As the pH scale (shown below) is logarithmic, the intervals are exponential, and thus represent far greater differences in concentration than the values seem to indicate.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

strong acid neutral strong alkali

Pure water has a pH of 7. The pH of seawater is 7.8-8.2, pH of gastric juices is 1.7, pH of urine is 5-7, pH of blood is 7.3-7.5 and the pH of milk is 6.5-7.

Physical state/form

means whether a material is in the solid, liquid or gaseous state at a specified temperature and pressure.

Poisons Schedule

means a listing of substances requiring specific labelling and precautions in use. The *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP) is published by the Australian Health Ministers' Advisory Council (AHMAC) and is the basis for Commonwealth, State and Territory poisons legislation.

ppm

means parts per million. ppm (w/v) in water = mg/L; ppm (w/w) in solids = mg/kg.

Practicable

means 'practicable' in Victoria, Queensland, Western Australia and the Northern Territory, 'reasonably practicable' in New South Wales, South Australia, the Australian Capital Territory, Tasmania and Commonwealth jurisdictions.

Product

means a material in a form that is sold or supplied.

Product name

means the brand name, trade name, code name or code number specified by a supplier.

Proper Shipping Name

means the formalised UN name used for identifying materials, which are classified as Dangerous Goods.

Risk

means the likelihood that a material will cause harm in the circumstances of its use.

Risk Phrase

means a phrase describing the hazard of a substance as provided in the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008].

Safety Phrase

means a phrase describing the safe handling, storage or use of personal protective equipment for a material.

Shall

means mandatory.

Should

means a recommendation.

Solubility

means a measure of how soluble a substance is. Solubility in water is usually expressed as g/L. Other units include g/100 cm³, percent w/v or ppm of water.

Skin irritation

means the production of inflammatory changes in the skin following the application of a test substance.

Specific gravity

means the ratio of the density of a material to the density of some standard material, such as water, at a specified temperature.

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP)

means the standard prepared by the Australian Health Ministers' Advisory Council (AHMAC).

Subsidiary risk

means a risk in addition to the class to which Dangerous Goods are assigned and which is determined by a requirement to have a subsidiary risk label in accordance with the ADG Code.

Substance

means any natural or artificial entity, composite material, mixture or formulation, other than an article.

Supplier

means a manufacturer or importer of hazardous substances or Dangerous Goods for the purposes of this code of practice.

Teratogenic

means able to produce abnormalities in a developing foetus, that is, causing birth defects.

TLV

means Threshold Limit Value. These values are a type of exposure standard promulgated by the American Conference of Governmental Industrial Hygienists (ACGIH).

Toxic effect

means the property of a substance producing damage to an organism. This usually refers to functional (systemic) damage but may be developmental in respect of tissue and skeleton in the case of the embryo. The damage may be permanent or transient.

Toxicity

means the capacity of a substance to produce damage to an organism. This usually refers to functional (systemic) damage but may be developmental in respect of tissue and skeleton in the case of the embryo. The damage may be permanent or transient.

Trade name

means a company product name which may or may not be registered.

Type I Ingredients

means an ingredient which: (a) in accordance with the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008] is carcinogenic, mutagenic, teratogenic, a skin or respiratory sensitiser, very corrosive, corrosive, toxic or very toxic, a harmful substance which can cause irreversible effects after acute exposure, or a harmful substance which can cause serious damage to health after repeated or prolonged exposure; OR (b) has an exposure standard listed in the National Occupational Health and Safety Commission's *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003]; AND (c) is present in a quantity which exceeds the lowest relevant concentration cut-off level specified for the hazard classification in the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008].

Type II Ingredients

means an ingredient which: (a) is a harmful substance (not covered by section 1(a) above) in accordance with the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008]; AND (b) is present in a quantity which exceeds the lowest relevant concentration cut-off level specified for the hazard classification in the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008].

Type III Ingredients

means any ingredient which does not meet the criteria for either Type I or Type II ingredients described above.

United Nations (UN) Number

means a system of four digit numbers assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods. UN Numbers are assigned to one material or to a group of materials with similar characteristics. They are not necessarily unique to one material, and may cover a group of materials with similar hazardous properties. For example, ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC - UN No. 3018.

Vapour density

means the ratio of the density of the vapour compared to the density of air. The density of air is nominally set to 1.0. Vapours with a vapour density greater than 1.0 will tend to stay close to the floor, whereas vapours with a vapour density less than 1.0 will tend to rise.

Volatile

means able to pass readily into the vapour state.

w/v

means weight per volume. This is a measure of the content of a solid in a solution.

w/w

means weight per weight. This is a measure of the content of a solid in a solid.

5 GUIDELINES FOR PREPARING MSDS

The supplier of hazardous substances and/or Dangerous Goods has a legal requirement to prepare an MSDS under Commonwealth, State and Territory legislation.

The writer of the MSDS needs to keep in mind that a Material Safety Data Sheet (MSDS) must inform its audience of the possible hazards of a material, and provide information on the safe storage, handling and disposal of the material. An MSDS contains information on the potential health effects of exposure and how to work safely with the material. It also contains hazard information on the use, storage, handling and emergency procedures related to that material.

When writing the MSDS, information should be presented in English in a consistent and complete form, with the workplace audience firmly in mind. However, it should be considered that all or part of the MSDS can be used to inform workers, employers, health and safety professionals, emergency personnel, relevant government agencies, as well as members of the community.

Language used in the MSDS 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', or 'harmless' are also unacceptable.

5.1 THE 16 HEADER MSDS – SECTIONS

The 16 header MSDS contains the following sections. Chapter 6 of this code details the information required for each of these 16 sections listed below:

- Section 1 Identification of the material and supplier
- Section 2 Hazards identification
- Section 3 Composition/information on ingredients
- Section 4 First aid measures
- Section 5 Fire fighting measures
- Section 6 Accidental release measures
- Section 7 Handling and storage
- Section 8 Exposure controls/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 Other information

All sections of an MSDS should be completed. Where information relevant to a particular section is not available, the MSDS should state 'Not available'. If the information item is not relevant, this should be noted as 'Not relevant'. Blank sections tend to confuse or mislead and are therefore unacceptable.

Abbreviations such as 'N/A' or 'N/R' should not be used, as their usage could lead to confusion. For example, 'N/A' may mean either 'not available' or 'not

applicable'. In general, where abbreviations are used, a legend explaining the abbreviations should be included.

5.2 INFORMATION REQUIREMENTS

There are information requirements for the preparation of an MSDS. For the purposes of this code, information has been separated into core and additional information.

Core information is essential to understanding the hazards of the material. It also allows MSDS prepared in accordance with this code of practice to be consistent with the information requirements of overseas systems. This information should always be included in the MSDS. The checklist at Appendix 1 illustrates the core information required in the MSDS.

The MSDS may also contain additional information. Where a material has additional relevant and available information about its nature and/or use, that information should be included. The checklist at Appendix 1 also illustrates the additional information.

5.3 DOCUMENT FORMAT

An MSDS is not a fixed length document. The length of the MSDS should be commensurate with the hazard of the material and the information available.

All pages of a printed MSDS should be numbered and the total number of pages also given on each page. For example, 'page 1 of 3', 'page 2 of 3', 'page 3 of 3'. An acceptable alternative is to number each page and to indicate on each page whether there is a page following.

An MSDS for Two Pack Systems

For two pack systems (e.g. two pack isocyanate paints or epoxy adhesives), an MSDS for each component material should be provided, with a clear description of the hazards, adverse health effects, safe handling and any other relevant information related to each component and the combined material.

There should be some indication of the end of the MSDS, such as the words 'End of MSDS'.

5.4 UNITS

Numbers and quantities should be expressed in units appropriate to Australia. For example, degrees Celsius (°C), not degrees Fahrenheit (°F), and litres, not gallons. In general, the International System of Units (SI) should be used. However, provision should be made for non-SI units where such units are in widespread usage in Australia. For example, mm Hg for vapour pressure, and degrees Celsius (°C) not degrees Kelvin (K) for temperature.

5.5 HOW TO CLASSIFY

A material is classified as hazardous and/or dangerous if it is:

- (a) classified as hazardous according to the latest edition of the NOHSC *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008] and is above the cut-off concentration criteria for being classified as a hazardous substance;
- (b) specified in the NOHSC *List of Designated Hazardous Substances* [NOHSC:10005];
- (c) classified for physicochemical hazards according to the ADG Code (including class(es), subsidiary risk(s), Packing Group, Proper Shipping Name and UN Number); and/or
- (d) specified as dangerous in the ADG Code or determined by the Competent Authorities.

5.6 ACCEPTABILITY OF AN OVERSEAS MSDS

Currently, MSDS prepared overseas are accepted by Commonwealth, State and Territory legislation if they meet the following requirements:

- (a) the MSDS is prepared in accordance with this code including the provision of the following information:
 - (i) Australian contact details – name of supplier, address and telephone number, including emergency contact details (see section 6.1);
 - (ii) classification in accordance with the Australian hazardous substance and Dangerous Goods regulatory framework (see section 6.2);
 - (iii) ingredient disclosure as required by Commonwealth, State and Territory legislation (see section 6.3);
 - (iv) national exposure standard value if available (see section 6.8); and
 - (v) relevant additional Australian regulatory information (see section 6.15).

Classification Alignment with Australia

Countries that use the same system of classification as Australia offer the basis for an acceptable MSDS. In general MSDS that use EC classification criteria will provide an MSDS that can more easily be adapted to Australian requirements.

Referencing Overseas Documents

Ensure that references to overseas documents (e.g. overseas exposure standards) are adequate to identify their source of origin.

5.7 EXPLANATORY TEXT

The information included in the boxed text throughout the code is supplementary guidance material and does not form part of this code of practice.

6 PREPARATION OF THE 16 HEADER MSDS

6.1 SECTION 1 - IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Provide the name and supplier of the product (material), recommended uses and the contact detail information of the supplier including an emergency contact in this section.

6.1.1 CORE INFORMATION

- Product (material) name.
- Other names.
- Recommended use.
- Supplier name, address, telephone number, and Australian emergency contact number.

6.1.2 Product (Material) Name

The identity of the material should be exactly as found on the label for the material.

If one generic MSDS is used to cover several grades or minor variants of a material, all grades or material names should be listed on the MSDS or the MSDS should clearly delineate the range of materials included.

6.1.3 Other Names

The material may also be identified by alternative names, numbers, company product codes, or other unique identifiers. Provide other names or synonyms by which the product is labelled or commonly known in Australia, if applicable. For Dangerous Goods the Proper Shipping Name, as identified in the ADG Code, should be provided in this subsection if it has not appeared as the product name. Additionally, the name as specified in the Australian Health Ministers' Advisory Council's (AHMAC) *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP), should be provided in this subsection if it has not appeared as the product (material) name.

6.1.4 Recommended Use

Provide the recommended or intended use of the material and indicate any restrictions on use.

6.1.5 Supplier Name, Address, Telephone Number and Australian Emergency Contact Number

Provide the name, address and phone number of the Australian supplier, including emergency phone number.

Companies should include references to emergency information services on their MSDS.

Emergency Phone Number

Indicate if the telephone numbers have any restrictions, such as hours of operation (e.g. Monday - Friday, 8:00 a.m. - 6:00 p.m., or 24 hours) or are limited to a specific type of information (e.g. general information, medical emergencies, transportation emergencies). Where a Poisons Information Centre (PIC) phone number is used, this arrangement should be confirmed with the PIC beforehand, and the PIC provided with copies of MSDS for all relevant materials.

6.2 SECTION 2 - HAZARDS IDENTIFICATION

Describe the hazards of the materials and the appropriate warning information (risk and safety phrases) associated with those hazards in this section.

6.2.1 CORE INFORMATION

- Hazard classification, including a statement of overall hazardous or dangerous nature.
- Risk phrase(s).
- Safety phrase(s).

6.2.2 Hazard Classification

This Section indicates the hazardous and/or dangerous classification of the material.

- (a) If the material is classified in accordance with section 5.5, provide a statement of overall hazardous or dangerous nature. The wording to be used is:

- (i) HAZARDOUS SUBSTANCE. DANGEROUS GOODS; or
- (ii) HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS; or
- (iii) DANGEROUS GOODS. NON-HAZARDOUS SUBSTANCE.

Description of Classification

It is useful to describe how the material was classified, e.g., 'Classified as hazardous according to the criteria of NOHSC'.

Non-Hazardous and Non-Dangerous Materials

Regarding NON-HAZARDOUS and NON-DANGEROUS materials, there is no legal requirement to provide an MSDS for such materials. However, it is good practice to do so as an MSDS is a well-accepted and effective method for the provision of workplace information.

6.2.3 Risk Phrase(s)

Based on the classification provide the appropriate risk phrase(s) (see *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008]).

GHS Hazard and Precautionary Statements

Risk and safety phrases are referred to as hazard and precautionary statements in the GHS.

6.2.4 Safety Phrase(s)

Based on the classification provide the appropriate safety phrase(s) (see *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008]).

Poisons Schedule

The *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP) lists some substances using a risk based classification system. This information should also be provided in section 15 of the MSDS.

6.3 SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Identify the ingredient(s) of the material in this section.

6.3.1 CORE INFORMATION

Pure substances

- Chemical identity of the pure substance.
- Common name(s), synonym(s).
- CAS Number(s).

Mixtures or Composite Materials

- Chemical identity of ingredients.
- Proportion of ingredients.
- CAS Number for ingredients.

6.3.2 Chemical Identity of the Pure Substance

The identity of a material is provided by its common chemical name.

For a pure substance, or each ingredient of a mixture, the chemical name should be assigned as follows:

- (a) the name as listed in the NOHSC *List of Designated Hazardous Substances* [NOHSC:10005]; and/or
- (b) the Proper Shipping Name assigned in the ADG Code where the substance is specifically listed in the ADG Code and meets the classification criteria of section 2 of that code; and/or
- (c) the name as it appears in the SUSDP where the substance is scheduled; and/or
- (d) the recognised chemical name as used in readily available scientific and technical handbooks, journals and texts, where none of the above are applicable.

The chemical name can be identical to the product name.

6.3.3 Common Name(s), Synonym(s)

Common names and synonyms should be provided where appropriate. Synonyms can include recognised abbreviations, for example, 'TDI' for toluene diisocyanate.

6.3.4 CAS Number(s)

The Chemical Abstract Service (CAS) Registry Number should be provided where available. Chemical Abstract Service Registry Numbers provide a unique identification. See Appendix 2 for more information.

6.3.5 Chemical Identity of Ingredients

For materials classified as hazardous substances or Dangerous Goods, the ingredients that contribute to that classification should be disclosed in accordance with subsections 6.3.5 to 6.3.7 of this code.

All ingredients may be listed, even if they are not hazardous substances or Dangerous Goods, as they may contribute to the effects of the material.

6.3.6 Proportion of Ingredients

(a) The material should have the proportion of ingredients described as:

- (i) exact percentages in descending order by mass or volume; or
- (ii) ranges of percentages in descending order by mass or volume.

Percentage Compositions

Percentage compositions should add up to or indicate a total of 100%, even if an estimate of non-hazardous ingredients needs to be provided.

(b) Ranges to be used are:

> 60% 30 – 60% 10 - < 30% < 10%.

(c) When using a proportion range, the health hazard effects should describe the upper limit of the range.

6.3.7 Confidentiality Provisions

As stated in section 6.3.2, ingredients should be listed by chemical name, common name and/or synonym. Commonwealth, State and Territory legislation have disclosure provisions for ingredients. However, concern about commercial confidentiality may cause the supplier to choose not to disclose the ingredient information. Non-disclosure is not acceptable for ingredients that are classified with a particular health hazard. The hazardous substances regulations deal with this by defining Type I, II and III Ingredients. Definitions of Type I, II and III ingredients are based on the material's toxicity and concentration in the final product.

Disclosure of Ingredients

When a material is classified as a hazardous substance and/or Dangerous Goods, the ingredients that contribute to the classification should be disclosed.

Type I Ingredients are those associated with serious health and/or safety hazards when present in mixtures above certain concentrations. Type I Ingredients, by definition, are associated with particular hazards (see Chapter 4), or have a National Exposure Standard, and are present in a quantity that exceeds the lowest relevant concentration cut-off level specified for the hazard classification. These ingredients must be disclosed with their full chemical name; generic names are not permitted. If the final material is classified as a Dangerous Goods, full disclosure of any ingredients that contribute to the classification is required.

Type II Ingredients are those that present less serious health hazards than Type I ingredients, when present in mixtures above certain concentrations, but which are still harmful. Confidentiality can be maintained for these ingredients through the use of a designated generic name that describes the hazardous functionality of the ingredient but avoids the specific chemical name. Appendix 3 provides guidance on the selection of generic names.

Type III Ingredients are those ingredients that are not classified as Type I or II ingredients or Dangerous Goods, either because of their low toxicity or because they are present in mixtures at levels below specified concentration cut-off levels. These materials do not need to be disclosed in the MSDS. However, to avoid confusion, it is recommended that all ingredients be indicated on the MSDS and the label. If commercial confidentiality is an issue, use a statement like 'other ingredients determined not to be hazardous' and a concentration range.

Where a Type III ingredient is not a hazardous substance but has known synergistic effects it should be identified.

If the ingredients are below the concentration cut-off for classification, but when combined cause the mixture to be classified as hazardous, these should be disclosed.

Where the chemical identity of an ingredient has not been disclosed on the MSDS, it is necessary to include the name and contact details on the MSDS for further information. The manufacturer or importer has an obligation under Commonwealth, State and Territory legislation to disclose the chemical identity of an ingredient in specific emergency and non-emergency situations.

Table 1 Summary of Ingredient Disclosure

MATERIAL	DEFINITION	DISCLOSURE
All Dangerous goods.		Full Disclosure.
Type I Ingredient	An ingredient which: (a) in accordance with the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008] is carcinogenic, mutagenic, teratogenic, a skin or respiratory sensitiser, very corrosive, corrosive, toxic or very toxic, a harmful substance which can cause irreversible effects after acute exposure, or a harmful substance which can cause serious damage to health after repeated or prolonged exposure; OR (b) has an exposure standard listed in the National Occupational Health and Safety Commission's <i>Exposure Standards for Atmospheric Contaminants in the Occupational Environment</i> [NOHSC:1003]; AND (c) is present in a quantity which exceeds the lowest relevant concentration cut-off level specified for the hazard classification in the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008].	Full disclosure is always required. The chemical name shall be disclosed on the MSDS. A claim of commercial confidentiality cannot be made. Generic names are not permitted.
Type II Ingredient	An ingredient which: (a) is a harmful substance (not covered by section 1(a) above) in accordance with the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008]; AND (b) is present in a quantity which exceeds the lowest relevant concentration cut-off level specified for the hazard classification in the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008].	Generic names are permitted. A generic name may be used which should describe the functionality of the ingredient, which contributes to the hazard. Appendix 3 provides guidance on the selection of a generic name.
Type III Ingredient	Any ingredient, which does not meet the criteria for either Dangerous Goods or Type I or Type II ingredients described above.	No disclosure is required. However, full description of any ingredients with a known adverse health effect or Dangerous Goods property is good practice.

Type I Ingredients

Based on the definition, ingredients with the following risk phrases (from the 1999 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008]) may be construed as Type 1 Ingredients:
R23, R24, R25, R26, R27, R28, R34, R35, R39, R40, R42, R43, R45, R46, R47, R48, R49, R60, R61, R62, R63.

Type II Ingredients

Based on this definition, ingredients with the following risk phrases (from the 1999 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008]) may be construed as Type 2 Ingredients:
R20, R21, R22, R29, R31, R32, R33, R36, R37, R38, R41, R64, R65.

6.4 SECTION 4 - FIRST AID MEASURES

Describe the initial care that can be given without the use of sophisticated equipment and without a wide selection of medications available. If medical attention is required, the instructions should state this, including its urgency.

6.4.1 CORE INFORMATION

- Description of necessary first aid measures according to routes of exposure.
- Indication of medical attention and any special treatment needed (notes to physician should include a description of most important symptoms, acute and delayed).

6.4.2 Description of Necessary First Aid Measures

Provide first aid instructions by relevant routes of exposure. Use subheadings to indicate the procedure for each route (e.g. inhalation, skin, eye, and ingestion).

Describe expected immediate and delayed symptoms.

Provide advice, including if:

- (a) immediate medical attention is required and if delayed effects can be expected after exposure;
- (b) movement of exposed individual from area to fresh air is recommended;
- (c) advice on removal and handling of clothing and shoes from individual is recommended;
- (d) any known antidotes may be administered by persons trained in their use as part of the recommended first aid procedure; and
- (e) any information on specific first aid facilities, such as showers or eyewashes, are necessary in a workplace where the particular material is used.

Scheduled Poison First Aid Advice

If a material is a scheduled poison, the first aid advice should be consistent with that required by the *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP).

6.4.3 Medical Attention and Special Treatment

Provide information on any medical and special treatments. For example, clinical testing and medical monitoring for delayed effects, specific procedures, details on emesis or lavage, antidotes, contraindications. Specific antidotes should be indicated where they are available. Describe the most important symptoms caused by exposure, whether acute or delayed.

6.4.4 ADDITIONAL INFORMATION

- Aggravated medical conditions caused by exposure.

6.4.5 Aggravated Medical Conditions Caused by Exposure

A list of possible 'aggravated medical conditions' may be included in this section.

6.5 SECTION 5 - FIRE FIGHTING MEASURES

Describe the fire and explosive properties of the material and provide advice on how to deal with incidents in this section.

6.5.1 CORE INFORMATION

- Suitable extinguishing media.
- Hazards from combustion products.
- Precautions for fire fighters and special protective equipment.

6.5.2 Suitable Extinguishing Media

Provide information on the appropriate type of extinguishers or fire fighting agents. In addition, indicate whether any extinguishers are inappropriate for a particular situation involving the material.

6.5.3 Hazards From Combustion Products

Provide advice on whether hazardous combustion products can occur when a material burns. For example:

- (a) *'may produce toxic fumes of carbon monoxide if burning'*; or
(b) *'produces oxides of sulfur and nitrogen on combustion'*.

6.5.4 Precautions For Fire Fighters and Special Protective Equipment

Provide advice on any precaution to be observed in fighting fire. For example, *'keep containers cool with water spray'*.

Provide information on protective clothing to be worn by fire fighters. For example, boots, overalls, gloves, equipment and breathing apparatus.

6.5.5 ADDITIONAL INFORMATION

- Hazchem Code

6.5.6 Hazchem Code

If a Hazchem Code is available it should be included. See the ADG Code for further information.

Emergency Services Information

Consult the emergency services authority for specific advice.

Hazchem Code

The Hazchem Code for bulk dangerous goods provides coded information on the fire-fighting medium to be used. This includes information on clothing and equipment for personal protection, the risk of violent reaction or explosion, spillage action and whether evacuation should be considered in the event of an incident with the material.

6.6 SECTION 6 - ACCIDENTAL RELEASE MEASURES

Recommend the appropriate response to spills, leaks, or releases in order to prevent or minimise the adverse effects on persons, property and the environment in this section.

6.6.1 CORE INFORMATION

- Emergency procedures.
- Methods and materials for containment and clean up.

6.6.2 Emergency Procedures

Provide advice on emergency procedures related to accidental spills and release of the material.

SAA/SNZ HB 76: DANGEROUS GOODS-INITIAL EMERGENCY RESPONSE GUIDE

This handbook provides emergency response information for safely dealing with accidents, spills, leaks or fires in which Dangerous Goods are involved. Information on hazards, protective clothing and emergency procedures is also given. It can be used for the transport and storage of all types of Dangerous Goods. UN Numbers and Proper Shipping Names (based on the UN Recommendations on the Transport of Dangerous Goods) are referenced to the appropriate emergency response guides.

6.6.3 Methods and Materials for Containment and Clean Up Procedures

Provide appropriate advice on how to contain and clean up a spill.

Appropriate containment techniques may include:

- (a) bunding, covering of drains; and
- (b) capping procedures.

Appropriate clean up procedures may include:

- (a) neutralisation techniques;
- (b) decontamination techniques;
- (c) adsorbent materials;
- (d) cleaning techniques;
- (e) vacuuming techniques; and
- (f) equipment required for containment/clean up (include the use of non-sparking tools and equipment).

Provide any other issues relating to spills and releases. For example, including advice on inappropriate containment or clean up techniques.

Distinguishing Spill Volumes

In 6.6.3, distinguish between responses for large and small spills where spill volume impacts significantly on the hazard; the procedures for containment and recovery may indicate different practices are required. If Personal Protective Equipment (PPE) is required for containment/clean up - refer readers to section 8 of the MSDS.

6.7 SECTION 7 - HANDLING AND STORAGE

Provide guidance on safe handling practices that minimise the potential hazards to people, property and the environment from the material. Emphasise precautions that are appropriate to the unique properties of the material, rather than reviewing general storage and handling practices.

6.7.1 CORE INFORMATION

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

6.7.2 Precautions for Safe Handling

Provide advice that:

- (a) minimises contact between the worker and the material;
- (b) prevents handling of incompatible materials; and
- (c) minimises the release of the material to the environment.

Include general warnings on what practices to avoid or restrict.

Safe Handling of Articles

Where an article, which contains a hazardous substance or Dangerous Goods, introduces a hazard of its own, then the hazards of that article should also be addressed when considering safe handling procedures. For example, when determining safe handling procedures for batteries and fire extinguishers.

6.7.3 Conditions for Safe Storage

Provide advice on specific storage requirements including:

- (a) How to avoid:
 - (i) explosive atmospheres;
 - (ii) corrosive conditions;
 - (iii) flammability hazards;
 - (iv) incompatible materials;
 - (v) evaporative conditions; and
 - (vi) potential ignition sources (including electrical equipment).
- (b) How to control the effects of:
 - (i) weather conditions;
 - (ii) ambient pressure;
 - (iii) temperature;
 - (iv) sunlight;
 - (v) humidity; and
 - (vi) vibration.
- (c) How to maintain the integrity of the material by the use of:
 - (i) stabilizers;
 - (ii) anti-oxidants; and
 - (iii) phlegmatisers.
- (d) Other advice including:
 - (i) ventilation requirements; and
 - (ii) packaging compatibilities.

Provision of General Hygiene Advice

It is good practice to provide advice on general hygiene. For example:

- prohibiting eating, drinking and smoking in contaminated areas;
- wash hands before eating; and
- remove contaminated clothing and protective equipment before entering eating areas.

Storage and Handling References

Further advice on storage and handling is provided in the:

- *National Code of Practice for the Storage and Handling of Workplace Dangerous Goods* [NOHSC:2017];
- SAA/SNZ HB 76:1997 *Dangerous Goods - Initial emergency response guide*, and
- Relevant Australian Standards.

Consistent Advice

Ensure that the advice provided is consistent with the physical and chemical properties in Section 9.

6.8 SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Detail engineering control measures needed to minimise exposure to and risks associated with the hazards of the material in this section.

6.8.1 CORE INFORMATION

- National exposure standards.
- Biological limit values.
- Engineering controls.
- Personal protective equipment.

6.8.2 National Exposure Standards**Exposure Standards**

NOHSC has approved *National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003].

Exposure standards represent airborne concentrations of individual chemical substances, which according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers.

Australian exposure standards are generally expressed as a Time-Weighted Average (TWA) concentration of that substance over an eight-hour working shift, and apply to an eight-hour day, for a five-day working week over an entire working lifetime. Short Term Exposure Limits (STEL) and Peak Limitations may also be specified for short periods of exposure such as 15 minutes.

These exposure standards may be reviewed from time to time and therefore the most recent edition of this publication should be consulted.

Where available, list the NOHSC exposure standards, including notations, for a pure substance and for each of the ingredients of a mixture. These should be referred to in the MSDS as ES-TWA, ES-STEL and ES-Peak. Use the chemical name, as specified in the *NOHSC Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003].

Alternative Standards

Where NOHSC exposure standards are not allocated, overseas exposure standards may be used. Examples of overseas standards include those of the Health and Safety Executive (HSE) in the United Kingdom, American Conference of Governmental Industrial Hygienists (ACGIH) or the German MAK.

If there is no exposure standard allocated, then the MSDS should state that there is 'no exposure standard allocated'.

6.8.3 Biological Limit Values

Where required under the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005], for the health surveillance of hazardous substances, the appropriate biological limit should be listed. Such limits are outlined in the *Guidelines for Health Surveillance* [NOHSC:7039].

Where NOHSC biological limits are not allocated, overseas limits may be used. Examples of overseas standards include those of the Health and Safety Executive (HSE) in the United Kingdom, American Conference of Governmental Industrial Hygienists (ACGIH) or the German BAT.

If there is no biological limit allocated, then the MSDS should state that there is 'no biological limit allocated'.

6.8.4 Engineering Controls

Engineering control measures

The description of appropriate exposure control measures should relate to the intended modes of use of the material. Indicate whether special engineering controls are necessary, and specify which type. For example:

- (a) 'use only in a well ventilated area';
- (b) 'maintain air concentrations below exposure standards';
- (c) 'use local exhaust ventilation';
- (d) 'use only in an enclosed system';
- (e) 'use only in spray paint booth or enclosure';
- (f) 'use mechanical handling to reduce human contact with materials'; or
- (g) 'use explosive dust handling controls'.

6.8.5 Personal Protective Equipment (PPE)

Identify the personal protective equipment (PPE) needed to minimise the potential for illness or injury due to exposure from the material.

Eye/face protection - specify the type of eye protection (safety glasses, goggles) and/or face shield required, based on the hazard of the material and potential for contact.

Skin protection - specify the protective equipment to be worn (e.g. gloves, boots, bodysuit) based on the hazards associated with the material and the potential for contact.

Respiratory protection - specify appropriate types of respiratory protection based on the exposure, including air-purifying respirators and the proper purifying element (cartridge or canister).

Thermal hazards - when specifying protective equipment to be worn for materials that represent a thermal hazard, special consideration should be given to the construction of the PPE.

Special Requirements for PPE

See also Section 5 of the MSDS for specific fire/chemical PPE advice.

Special requirements may exist for gloves or other protective clothing to prevent skin, eye or lung exposure. Where relevant, this type of PPE should be clearly stated. For example, 'PVC gloves' or 'nitrile rubber gloves'.

Special requirements may exist for respirators. Vague information such as 'use face mask' is not acceptable whereas 'use half-face filter respirator suitable for organic vapours' would be acceptable.

6.9 SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Describe the empirical data of the material in this section. Refer to the definitions in Chapter 4 for further information.

6.9.1 CORE INFORMATION

Clearly identify the following properties and note if specific characteristics do not apply, are not available or are irrelevant.

Specify appropriate units of measure and/or reference conditions where appropriate.

- (a) Appearance (colour, physical form, shape).
- (b) Odour.
- (c) pH.
- (d) Vapour pressure.
- (e) Vapour density.
- (f) Boiling point/range.
- (g) Freezing/melting point (specify which).
- (h) Solubility (specify solvent, e.g. water).
- (i) Specific gravity or density.
- (j) Information for flammable materials, including:
 - (i) flash point and method of detecting flash point;
 - (ii) upper and lower flammable (explosive) limits in air; and
 - (iii) ignition temperature.

Provision of Physical/Chemical Information

The data included in this subsection should apply to the material as used at work. If the material is a mixture or formulation, the physical data should describe the mixture or formulation. If that information is not available the physical/chemical properties of the ingredients should be provided.

6.9.2 ADDITIONAL INFORMATION

- (a) Specific heat value.
- (b) Particle size.
- (c) Volatile organic compounds (VOC) content.
- (d) Evaporation rate.
- (e) Viscosity.
- (f) Percent volatile.
- (g) Octanol/water partition coefficient.
- (h) Saturated vapour concentration (include reference temperatures).
- (i) Additional characteristics not noted above may also be provided if applicable to the material.
- (j) Flame propagation or burning rate of solid materials.
- (k) Properties of both flammable and non-flammable materials that may initiate or uniquely contribute to the intensity of a fire (e.g. Class 4 or Class 5).
- (l) Potential for dust explosion.
- (m) Reactions that release flammable gases or vapours.
- (n) Fast or intensely burning characteristics.
- (o) Non-flammables that could contribute unusual hazards to a fire, such as strong oxidizing and reducing agents or peroxide formers.
- (p) Release of invisible flammable vapours and gases.
- (q) Decomposition temperature.

6.10 SECTION 10 - STABILITY AND REACTIVITY

Describe reactivity hazards of the material in this section.

Provide specific test data for the product 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 material.

6.10.1 CORE INFORMATION

- Chemical stability.
- Conditions to avoid.
- Incompatible materials.
- Hazardous decomposition products.
- Hazardous reactions.

6.10.2 Chemical Stability

Indicate if the material is stable or dangerously unstable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

6.10.3 Conditions to Avoid

List conditions such as heat, pressure, shock, or other physical stresses that might result in a hazardous situation.

6.10.4 Incompatible Materials

List classes of chemicals or specific materials with which the material could react to produce a hazardous situation (e.g. explosion, release of toxic or flammable materials, liberation of excessive heat).

Availability of Data

If data for mixtures are not available, ingredient data should be provided.

In determining incompatibility, consider the materials, containers, and contaminants that the material might be exposed to during transportation, storage and use.

6.10.5 Hazardous Decomposition Products

List known and reasonably anticipated hazardous materials produced as a result of oxidation, heating, or reaction with another material, including the production of flammable and toxic materials.

6.10.6 Hazardous Reactions

If relevant, state if the material will react or polymerize, releasing excess pressure or heat, or creating other hazardous conditions. Describe under what conditions the hazardous reactions may occur.

6.11 SECTION 11 - TOXICOLOGICAL INFORMATION

Describe, in lay language, the potential adverse health effects and symptoms associated with exposure to the material and its ingredients or known by-products.

While this section is used primarily by medical professionals, occupational health and safety professionals, and toxicologists, the language used in this section should be understandable to anyone in the workplace.

6.11.1 CORE INFORMATION

Health effects from likely routes of exposure and symptoms related to the physical, chemical and toxicological characteristics as determined by the classification, including:

- (a) acute and chronic health effects;
- (b) possible routes of exposure;
- (c) range of effects following exposure;
- (d) dose, concentration or conditions of exposure likely to cause injury;
- (e) delayed effects; and
- (f) relevant negative data.

6.11.2 Health Effects from Likely Routes of Exposure

Provide information on:

- (a) acute and chronic health effects relating to human exposure to the material. Where human data are not available, animal data should be summarised and the species clearly identified;
- (b) the effects of the material via each possible route of exposure that is, through ingestion (swallowing), inhalation or skin/eye exposure. A statement should be made if these health effects are not known;
- (c) the effects following exposure, ranging from the first symptoms at the lowest exposures 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';
- (d) the dose, concentration or conditions of exposure likely to cause injury. Where possible, doses should be linked to symptoms and effects and include 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';
- (e) whether delayed effects can be expected after short or long term exposure; and
- (f) relevant negative data. For example, the statement 'carcinogenicity studies in the rat have shown no significant increase in the incidence of cancer'.

GUIDANCE ON COMPLETING SECTION 11

GENERAL VERSUS SPECIFIC STATEMENTS

General statements such as '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', '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 SPECIFIC CHEMICAL DATA ARE NOT AVAILABLE

It may not always be possible to obtain information on the hazards of a substance as many have never been fully tested. In cases where data on the specific substance are not available, data on the chemical class, if appropriate, may be used. Where generic data are used or where data are not available, this should be stated clearly on the MSDS.

MIXTURE VS INGREDIENT INFORMATION

Most frequently the material requiring an MSDS is a mixture. If the mixture has not been tested for its health effects as a whole then information on ingredients should be provided. After collecting data on health effects and dose-response for each ingredient, an estimation of the combined health effects needs to be made. When using ingredient data to estimate the health effects of a mixture the following should be taken into account:

- (a) the concentrations of the ingredients, including airborne concentrations;
- (b) the relevant hazard of the material; and
- (c) any potential interactions in the body between the 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.

It is necessary to consider 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:

- (a) if the information is duplicated, it is not necessary to list this more than once. For example, if two ingredients both cause vomiting and diarrhoea, it is not necessary to list this twice. Overall, the mixture is described as causing vomiting and diarrhoea;
- (b) 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, there comes a point where the overall mixture would be unlikely to cause irritation.

Predicting the interactions between ingredients is extremely difficult, and where information on interactions is not available, assumptions should not be made and instead the health effects of each ingredient should be listed separately.

SUMMARY OF TOXICITY DATA

Summarise the data available. Where there is a substantial amount of test data on the ingredient or the material, it may be desirable to summarise results by route of exposure or to discuss only selected studies that are representative of the hazards that give rise to the classification reported in Section 2 of the MSDS.

HUMAN/ANIMAL DATA

If there are human data, including exposure information, human case histories or epidemiological studies these should be highlighted. Where there are no human data, report effects based on animal testing. All studies should be adequately referenced including the epidemiological studies.

CARCINOGENICITY STUDIES

Carcinogenicity studies should include whether the evidence is animal or human, the type of study and the type of cancer and/or organs affected.

In addition, where possible, an indication of the weight of evidence for carcinogenicity in humans should be included. This can be obtained from government/international agencies, which evaluate the carcinogenic potential of selected substances. A sample statement would be 'has been classified as a probable human carcinogen by the International Agency for Research on Cancer'.

COMPOUNDING EFFECTS

Information on compounding effects should be included if relevant. For example:

- (a) if symptoms are exacerbated by drinking alcohol, taking medication or smoking;
- (b) if the substance is secreted in breast milk; or
- (c) if pre-existing medical conditions such as asthma, high blood pressure or a predisposition to allergic reactions may place an individual at an increased risk.

OTHER INFORMATION

All information on adverse health effects should be included even when not required by the Approved Criteria.

6.12 SECTION 12 - ECOLOGICAL INFORMATION*

Provide information to evaluate the environmental impact of the material if it is released to the environment. It 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 should be stated.

6.12.1 CORE INFORMATION

- Ecotoxicity.
- Persistence and degradability.
- Mobility.

6.12.2 Ecotoxicity

Ecotoxicity information can be provided using aquatic and/or terrestrial toxicity data, where available. The relevant ecotoxicological classification criteria are found in the Approved Criteria. Examples of hazard statements for ecotoxicity are as follows:

- (a) very toxic to aquatic organisms;
- (b) may cause long-term adverse effects in the aquatic environment;
- (c) toxic to flora;
- (d) toxic to fauna;
- (e) toxic to soil organisms;
- (f) toxic to bees;
- (g) may cause long-term adverse effects in the environment; and
- (h) dangerous to the ozone layer.

***Regulatory Requirements on the Provision of Ecological Information**

Provision of ecological information is a requirement of the GHS. At the time of publication of this code, there is no consistent national requirement under the Commonwealth, State and Territory hazardous substances regulations to provide this information. However, under Dangerous Goods regulation, some States and Territories require this information.

Advice on Ecological Information

National chemical assessment schemes include assessment of environmental hazards. Refer to NICNAS, Environment Australia (EA) or National Registration Authority (NRA) reports for advice on ecotoxicity, persistence, degradability and mobility.

6.12.3 Persistence/Degradability

Information on persistency/degradability can be determined using half-life data for soils and/or water/sediment systems. Where a ready biodegradability study has been conducted, the results of this can also be reported in this section. If using persistence statements, ensure that the criteria are referenced. Refer to the Environment Australia (EA) website <www.ea.gov.au> for the relevant criteria.

6.12.4 Mobility

Information on mobility can be determined from relevant mobility data such as adsorption studies or leaching studies. Modeled data are also acceptable. For example, K_{oc} values can be predicted from octanol/water partition co-efficients. Leaching and mobility can be predicted from models such as PRZM (software package). If using mobility statements, ensure that the criteria are referenced. Refer to the Environment Australia (EA) website <www.ea.gov.au> for the relevant criteria.

6.12.5 ADDITIONAL INFORMATION

- (a) Environmental Fate (exposure).
- (b) Bioaccumulative potential.
- (c) Other adverse environmental effects.

6.13 SECTION 13 - DISPOSAL CONSIDERATIONS

Provide information on disposal and recycling or reclamation of the material and/or its container in this section.

6.13.1 CORE INFORMATION REQUIRED

- Disposal methods, including disposal of containers.
- Special precautions for landfill or incineration.

Waste Classification

The generator of waste has the responsibility for proper waste classification, transportation and disposal.

Classify waste under applicable State and local regulations.

6.13.2 Disposal Methods

Provide information for proper disposal, recycling or reclamation of the material and/or its container to assist in the determination of safe and environmentally preferred waste management options.

- (a) Specify disposal containers and methods.
- (b) Discuss physical/chemical properties that may affect disposal options.
- (c) Discourage sewage disposal.

Information on the Manufactured Material

Advise that the information applies to the material as manufactured. Processing, use, or contamination may make the information inappropriate, inaccurate, or incomplete.

6.13.3 Special Precautions for Landfill or Incineration

Where appropriate, identify any special precautions for incineration or landfill.

6.14 SECTION 14 - TRANSPORT INFORMATION

Provide basic classification information for the preparation of a material for transporting/shipment.

Where information is not available or relevant this should be stated.

6.14.1 CORE INFORMATION

- UN Number.
- UN Proper Shipping Name.
- Class and subsidiary risk(s).
- Packing Group.
- Special precautions for user.
- Hazchem Code.

6.14.2 UN Number

Provide the UN Number from the ADG Code for Dangerous Goods. The UN Number is assigned to goods by The UN Committee of Experts on the Transport of Dangerous Goods and is published by the UN in *Recommendations on the Transport of Dangerous Goods*.

6.14.3 Proper Shipping Name

Provide the Proper Shipping Name. The Proper Shipping Name is used to identify Dangerous Goods and is in upper case lettering in APPENDIX 2 of the Technical References of the ADG Code.

6.14.4 Class and Subsidiary Risk(s)

Provide the class and subsidiary risk(s) for Dangerous Goods. The classes are specified in the ADG Code.

6.14.5 Packing Group

Provide the Packing Group number. The Packing Group number is a convention used to classify the degree of hazard within a class for most Dangerous Goods of Classes 3 to 9. Packing Group I is the highest hazard and Packing Group III the lowest. The Packing Group is specified in the ADG Code.

6.14.6 Special Precautions for User

Any other special requirements (for example, hazards such as shock sensitivity or specific storage requirements during transit/warehousing) should be restated here, if relevant to transport.

6.14.7 Hazchem Code

Provide the Hazchem Code as published in the ADG Code.

6.14.8 ADDITIONAL INFORMATION

- Material for export – advice on overseas regulatory transport requirements.

6.14.9 Material for export

If the product is intended for export, section 14 Transport Information, may indicate the relevant international regulatory transport requirements. For example:

- (a) US Department of Transport requirements such as technical names, hazardous substances/reportable quantities, modal restrictions, packaging, labelling, or exemptions;

- (b) surface shipments in Europe - *International Regulations Concerning the Carriage of Dangerous Goods by Road (ADR)* and *European Agreements Concerning the International Carriage of Dangerous Goods by Rail (RID)*;
- (c) shipment by water - *International Maritime Organization Rules (IMDG Code)*; and
- (d) shipment by air - *International Civil Aviation Organization (ICAO)* and *International Air Transport Association (IATA)* regulations.

6.15 SECTION 15 - REGULATORY INFORMATION

Describe any other regulatory information on the material that is not provided elsewhere in the MSDS.

6.15.1 CORE INFORMATION

The regulatory status of a material (including its ingredients) under relevant Australian health, safety and environmental legislation including:

- (a) the *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP) established under the Therapeutic Goods Act (1989) (as amended);
- (b) any applicable prohibition or notification/licensing requirements, including for carcinogens under Commonwealth, State or Territory legislation;
- (c) the *Agricultural and Veterinary Chemicals Act 1988* and/or applicable Commonwealth, State or Territory control of use legislation; and
- (d) the *Industrial Chemicals (Notification and Assessment) Act 1989*; including listing on the *Australian Inventory of Chemical Substances* (AICS).

Poisons Schedule Number

If the substance has not been scheduled, then the MSDS should state that there is no Poisons Schedule number allocated to the substance. For example, 'no Poisons Schedule number allocated' and 'none allocated'.

6.15.2 ADDITIONAL INFORMATION

Additional national and/or international regulatory information should be included here.

6.16 SECTION 16 - OTHER INFORMATION

Provide information relevant to the preparation of the MSDS in this section.

6.16.1 CORE INFORMATION

Date of preparation or last revision of the MSDS.

6.16.2 ADDITIONAL INFORMATION

- (a) Provide a key/legend to abbreviations and acronyms used in the MSDS.
- (b) Provide literature references.
- (c) Provide sources for data.

Preparation and Revisions

When revisions are made to an MSDS, clearly indicate where the changes have been made to the previous version of the MSDS, with an explanation of the changes.

7

REFERENCES

National Occupational Health and Safety Commission, 'National Model Regulations for the Control of Workplace Hazardous Substances' [NOHSC:1005(1994)] in *Control of Workplace Hazardous Substances: National Model Regulations and National Code of Practice*, Australian Government Publishing Service, Canberra, 1994, <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-21.htm>>.

National Occupational Health and Safety Commission, 'National Code of Practice for the Control of Workplace Hazardous Substances' [NOHSC:2007(1994)] in *Control of Workplace Hazardous Substances: National Model Regulations and National Code of Practice*, Australian Government Publishing Service, Canberra, 1994, <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-12.htm>>.

National Occupational Health and Safety Commission, 'National Model Regulations for the Control of Scheduled Carcinogenic Substances [NOHSC:1011(1995)]', in *Control of Workplace Hazardous Substances Part 2 – Scheduled Carcinogenic Substances: National Model Regulations and National Code of Practice*, Australian Government Publishing Service, Canberra, 1995, <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-22.htm>>.

National Occupational Health and Safety Commission, 'National Code of Practice for the Control of Scheduled Carcinogenic Substances [NOHSC:2014(1995)]', in *Control of Workplace Hazardous Substances Part 2 – Scheduled Carcinogenic Substances: National Model Regulations and National Code of Practice*, Australian Government Publishing Service, Canberra, 1995, <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-20.htm>>.

National Occupational Health and Safety Commission, *National Standard for the Storage and Handling of Workplace Dangerous Goods* [NOHSC:1015(2001)], National Occupational Health and Safety Commission, Sydney, 2001, <http://www.nohsc.gov.au/pdf/standards/NOHSC-1015-2001_STANDARD.pdf>.

National Occupational Health and Safety Commission, *National Code of Practice for the Storage and Handling of Workplace Dangerous Goods* [NOHSC:2016(2001)], National Occupational Health and Safety Commission, Sydney, 2001, <http://www.nohsc.gov.au/pdf/standards/NOHSC-2017-2001_COP_pt01.pdf>.

National Occupational Health and Safety Commission, *National Code of Practice for Labelling Hazardous Substances and Dangerous Goods in the Workplace* [NOHSC:2012(1994)], National Occupational Health and Safety Commission, Canberra, 2002.

National Occupational Health and Safety Commission, 'Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)]', in *Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards*, AusInfo, Canberra, 1995, <<http://www.nohsc.gov.au/OHSInformation/Databases/ExposureStandards/toc/expsearch.asp>>.

National Occupational Health and Safety Commission, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1999)], AusInfo, Canberra, 1999, <http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/standards/nohsc1008_toc.htm>.

National Occupational Health and Safety Commission, *Guidelines for Health Surveillance* [NOHSC:7039(1995)], AusInfo, Canberra, 1995, <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/01997-01.htm>>.

National Occupational Health and Safety Commission, *List of Designated Hazardous Substances* [NOHSC:10005(1999)], AusInfo, Canberra, 1999, <<http://www.nohsc.gov.au/OHSInformation/Databases/HazardousSubstances/>>.

National Road Transport Commission and Federal Office of Road Safety, *Australian Code for the Transport of Dangerous Goods by Road and Rail*, 6th Edition, Australian Government Publishing Service, Canberra, 1998.

Australian Health Ministers' Advisory Council, *Standard for the uniform scheduling of drugs and poisons No. 16*, Australian Government Publishing Service, Canberra, 1999.

NOTE: Reference should be made to the relevant Commonwealth, State and Territory legislation, which has adopted these national references.

APPENDIX 1 – 16 HEADER CHECKLIST

This Checklist outlines the necessary information to prepare the 16 header MSDS format required under workplace hazardous substances and Dangerous Goods legislation. A copy of this checklist can be downloaded from <www.nohsc.gov.au>.

Core information is listed in regular fount, *additional information is in italics.*

SECTION 1 IDENTIFICATION OF THE MATERIAL AND SUPPLIER

- ☐ Product (material) name
- ☐ Other names
- ☐ Recommended use
- ☐ Supplier name/address/telephone no./Emergency phone number

SECTION 2 HAZARDS IDENTIFICATION

- ☐ Hazard classification, including a statement of overall hazardous or dangerous nature
- ☐ Risk phrase(s)
- ☐ Safety phrase(s)

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE

- ☐ Chemical identity of the pure substance
- ☐ Common name(s), synonym(s)
- ☐ CAS Number(s)

MIXTURE

- ☐ Chemical identity of ingredients
- ☐ Proportion of ingredients
- ☐ CAS Number(s) for ingredients

SECTION 4 FIRST AID MEASURES

- ☐ Description of necessary measures according to routes of exposure
- ☐ Indication of medical attention and special treatment needed including description of most important symptoms, acute and delayed

Additional information

- ☐ *Aggravated medical conditions caused by exposure*

SECTION 5 FIRE FIGHTING MEASURES

- ☐ Suitable extinguishing media
- ☐ Hazards from combustion products
- ☐ Special protective precautions and equipment for fire fighters

Additional information

- ☐ *Hazchem Code*

SECTION 6 ACCIDENTAL RELEASE MEASURES

- ☐ Emergency procedures
- ☐ Methods and materials for containment and clean up

SECTION 7 HANDLING AND STORAGE

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

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

- ☐ National exposure standards
- ☐ Biological limit values
- ☐ Engineering controls
- ☐ Personal protective equipment

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

- ☐ Appearance (colour, physical form, shape).
- ☐ Odour.
- ☐ pH.
- ☐ Vapour pressure.
- ☐ Vapour density.
- ☐ Boiling point/range.
- ☐ Freezing/melting point (specify which).
- ☐ Solubility (specify solvent, e.g. water).
- ☐ Specific gravity or density.

Information for flammable materials, including:

- ☐ flash point and method of detecting flash point;
- ☐ upper and lower flammable (explosive) limits in air; and
- ☐ ignition temperature.

Additional information

- ☐ *Specific heat value.*
- ☐ *Particle size.*
- ☐ *Volatile organic compounds (VOC) content.*
- ☐ *Evaporation rate.*
- ☐ *Viscosity.*
- ☐ *Percent volatile.*
- ☐ *Octanol/water partition coefficient.*
- ☐ *Saturated vapour concentration (include reference temperatures).*
- ☐ *Additional characteristics not noted above may also be provided if applicable to the material.*
- ☐ *Flame propagation or burning rate of solid materials.*
- ☐ *Properties of both flammable and non-flammable materials that may initiate or uniquely contribute to the intensity of a fire (e.g. Class 4 or Class 5).*
- ☐ *Potential for dust explosion.*
- ☐ *Reactions that release flammable gases or vapours.*
- ☐ *Fast or intensely burning characteristics.*
- ☐ *Non-flammables that could contribute unusual hazards to a fire, such as strong oxidizing and reducing agents or peroxide formers.*
- ☐ *Release of invisible flammable vapours and gases.*
- ☐ *Decomposition temperature.*

SECTION 10 STABILITY AND REACTIVITY

- ☐ Chemical stability
- ☐ Conditions to avoid
- ☐ Incompatible materials
- ☐ Hazardous decomposition products
- ☐ Hazardous reactions

SECTION 11 TOXICOLOGICAL INFORMATION

- ☐ Health effects from the likely routes of exposure

SECTION 12 ECOLOGICAL INFORMATION

- ☐ Ecotoxicity
- ☐ Persistence and degradability
- ☐ Mobility

Additional information

- ☐ *Environmental fate (exposure)*
- ☐ *Bioaccumulative potential*

SECTION 13 DISPOSAL CONSIDERATIONS

- ☐ Disposal methods and containers
- ☐ Special precautions for landfill or incineration

SECTION 14 TRANSPORT INFORMATION

- ☐ UN Number
- ☐ UN Proper Shipping Name
- ☐ Class and subsidiary risk
- ☐ Packing Group
- ☐ Special precautions for user
- ☐ Hazchem Code

SECTION 15 REGULATORY INFORMATION

- ☐ The regulatory status of a material (including its ingredients) under relevant Australian health, safety and environmental legislation.

Additional information

- ☐ *Additional national and/or international regulatory information.*

SECTION 16 OTHER INFORMATION

- ☐ Date of preparation or last revision of the MSDS

Additional information

- ☐ *Key/legend to abbreviations and acronyms used in the MSDS.*
- ☐ *Literature references.*
- ☐ *Sources for data.*

APPENDIX 2 - INFORMATION SOURCES

INFORMATION SOURCES RELEVANT TO THE PREPARATION OF MATERIAL SAFETY DATA SHEETS

1. HAZARD CLASSIFICATION (SEE ALSO CARCINOGENS)

List of Designated Hazardous Substances

NOHSC (National Occupational Health & Safety Commission).

A database of the more common hazardous substances, which provides guidance on the appropriate Risk and Safety information for the MSDS.

Free at: <<http://www.nohsc.gov.au/OHSInformation/Databases/HazardousSubstances/>>

Classification, hazardous substances, Risk phrases and Safety phrases.

Approved Criteria for Classifying Hazardous Substances

NOHSC (National Occupational Health & Safety Commission).

This document outlines the approved Australian classification criteria used in determining whether a substance is hazardous.

Free at: <http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/standards/nohsc1008_toc.htm>

2. NOHSC CODES OF PRACTICE

The following codes of practice provide useful information on hazardous substances and Dangerous Goods.

Hazardous Substances

National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC:2007(1994)].

Free at: <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-12.htm>>

National Code of Practice for the Control of Scheduled Carcinogenic Substances [NOHSC:2014(1995)].

Free at: <<http://www.nohsc.gov.au/OHSInformation/NOHSCPublications/fulltext/toc/H3-20.htm>>

Dangerous Goods

National Standard for the Storage and Handling of Workplace Dangerous Goods [NOHSC:1015(2001)].

Free at: <http://www.nohsc.gov.au/pdf/standards/NOHSC-2017-2001_COP_pt01.pdf>

3. AUSTRALIAN STANDARDS

The Australian Standards for the following classes of Dangerous Goods form an important part of the Dangerous Goods framework and contain useful guidance for the control of the hazards associated with these classes of Dangerous Goods.

Class 2 - Gases

AS/NZS 1596	The storage and handling of LP gas.
AS 1894	Code of practice for the safe handling of cryogenic fluids.
AS 2022	SAA anhydrous ammonia code.
AS 2927	The storage and handling of liquefied chlorine gas.
AS 3961	Liquefied natural gas – storage and handling.
AS 4332	Storage and handling of gases in cylinders.

Class 3 - Flammable and Combustible Liquids

AS 1940	The storage and handling of flammable and combustible liquids.
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Class 5 - Oxidizing Agents and Organic Peroxides

AS 2714	The storage and handling of hazardous chemical materials - Class 5.2 substances (organic peroxides).
AS 4326	The storage and handling of oxidising agents.

Class 6 - Toxic Substances

AS/NZS 4452	The storage and handling of toxic substances.
AS 4081	The storage, handling and transport of liquid and liquefied polyfunctional isocyanates.

Class 8 - Corrosive Substances

AS 3780	The storage and handling of corrosive substances.
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Class 9 - Miscellaneous

AS/NZS 4681	The storage and handling of Class 9 (miscellaneous) Dangerous Goods and articles.
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Mixed Classes

AS/NZS 3833	The storage and handling of mixed classes of Dangerous Goods in packages and intermediate bulk containers.
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Subscription details at: <<http://www.standards.com.au>>

4. EXPOSURE STANDARDS

Exposure Standards for Atmospheric Contaminants in the Occupational Environment.

Exposure Standards Database.

NOHSC (National Occupational Health & Safety Commission).

The Exposure Standards database is a searchable database providing the airborne concentrations of individual chemical substances, which according to current knowledge should neither, impair the health of, nor cause undue discomfort to, nearly all workers. The exposure standards serve as guides only.

Free at: <<http://www.nohsc.gov.au/OHSInformation/Databases/ExposureStandards/expsearch.asp>>

Exposure standards and hazardous substances.

5. PLAIN ENGLISH FACT SHEETS ON CHEMICALS

CHEMINFO

Canadian Centre for Occupational Health and Safety.

Comprehensive summarized occupational health and safety information on chemicals written in non-technical language. Each profile provides a detailed evaluation of health, fire and reactivity hazards, as well as recommendations on topics such as handling and storage, personal protective equipment, accidental release, first aid, and hazard classifications, including WHMIS, OSHA and the European Union (EU). Records are designed for use by health and safety professionals, employees working with chemicals, users and writers of Material Safety Data Sheets, fire fighters, and other emergency response personnel.

Subscription details at: <<http://www.ccohs.ca/products/databases/cheminfo.html>>

Classification, first aid, hazardous substances, personal protective equipment, and storage.

New Jersey Right to Know Hazardous Substance Fact Sheets

These fact sheets provide brief and clear information on the identification, routes of exposure, health hazards, US exposure limits and workplace controls and practices for over 900 hazardous chemicals under the New Jersey Right to Know legislation.

Free at: <<http://www.state.nj.us/health/eoh/rtkweb/rtkhsfs.htm>>

Exposure routes, first aid, and hazardous substances.

ToxFAQs

Agency for Toxic Substances and Disease Registry.

Searchable and browse able database of hazardous substances which provides answers to the most frequently asked questions about exposure to hazardous substances found around hazardous waste sites and the effects of exposure on human health.

Free at: <<http://www.atsdr.cdc.gov/toxfaq.html>>

NIOSH Pocket Guide

National Institute for Occupational Safety and Health (US).

Provides general industrial hygiene information on several hundred chemicals/classes for workers, employers, and occupational health professionals. The NPG does not contain an analysis of all pertinent data, rather it presents key information and data in abbreviated or tabular form for chemicals or substance groupings (e.g. cyanides, fluorides, manganese compounds) that are found in the work environment. The information in the NPG includes chemical structures and formula, identification codes, synonyms, exposure limits, chemical and physical properties, incompatibilities and reactivities, measurement methods, respirator selections, signs and symptoms of exposure, and procedures for emergency treatment.

Free at: <<http://www.cdc.gov/niosh/npg/npg.html>>

Exposure standards, personal protective equipment, and hazardous substances.

6. CARCINOGENS

CANCERLIT

National Cancer Institute, US.

CANCERLIT is a bibliographic database, which indexes all areas of the international literature on cancer from the 1960s to the present, providing references and summaries. It is updated with more than 8,000 records every month.

Free at: <http://www.cancer.gov/search/cancer_literature/>

Carcinogens, mutagens, and toxicology.

IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans.

International Agency for Research on Cancer

These monographs are critical reviews of the literature on chemicals, industrial processes and industries associated with human cancer by the various IARC working groups.

IARC provides a searchable database of chemical agents and their evaluations as well as a complete list of agents, mixtures and exposures and their classification available free at:

Summaries free at: <<http://monographs.iarc.fr/>>

Full monographs available in print, CD-ROM and via Internet subscription.

Go to: <<http://www.qmai.com/>>

Carcinogens, classification, and hazardous substances.

CCRIS (Chemical Carcinogenesis Research Information System)

CCRIS contains scientifically evaluated data derived from carcinogenicity, mutagenicity, tumour promotion, and tumour inhibition studies on over 2500 chemicals.

Free at: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS>>

Carcinogens, hazardous substances, and mutagens.

7. CHEMICAL IDENTIFICATION AND VERIFICATION

ChemIDplus

National Library of Medicine, US.

ChemID*plus* is a free, web-based search system that provides access to structure and nomenclature authority files used for the identification of chemical substances cited in National Library of Medicine (NLM) databases. ChemID*plus* also provides structure searching and direct links to many biomedical resources at NLM and on the Internet for chemicals of interest. The database contains over 349,000 chemical records, of which over 56,000 include chemical structures, and is searchable by Name, Synonym, CAS Registry Number, Molecular Formula, Classification Code, Locator Code, and Structure.

Free at: <<http://chem.sis.nlm.nih.gov/chemidplus/setupenv.html>>

Registry File

The Registry File contains over 15 million unique chemical substance records identified by the Chemical Abstracts Service (CAS). Records contain identifying information such as CAS Registry numbers, CA index names, commonly used synonyms and some trade names, polymer class terms, molecular formula and structure diagrams. The Registry file is unique to STN and the locator field indicates which other files (indexed by CAS numbers) on the STN system contain information on the chemical - thus it will indicate whether there is a record for the chemical in RTECS, HSDB, Chemlist, Medline, Toxline, Toxlit etc.

Subscription details at: <<http://www.cas.org>>

8. PERSONAL PROTECTIVE EQUIPMENT

HAZARDTEXT

Micromedex.

HAZARDTEXT information to assist with the management of hazardous chemical incidents such as spills or leaks - toxicity, fire and explosion data, chemical reactivity, personal protective equipment and disposal guidelines. A good source of information on personal protective equipment.

Subscription details at: <<http://www.micromedex.com>>

Hazardous substances, chemical spills, emergency procedures, and personal protective equipment.

9. TOXICITY REVIEWS

The following sources provide full text reviews of the toxicity of chemical substances.

Environmental Health Criteria

International Programme on Chemical Safety.

These criteria are reviews of environmental and toxicological literature on chemicals and physical agents published as a joint venture of the United Nations Environment Programme, the International Labour Organization and the World Health Organization.

Free at: <<http://www.inchem.org/pages/ehc.html>>

ECETOC

The European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC).

ECETOC publishes a range of reports varying in scope from those on specific chemicals (e.g. the Joint Assessment of Commodity Chemicals reports (JACC)) to those dealing with the fundamental principles underlying the various branches of science in toxicology and ecotoxicology (e.g. monographs and technical reports). ECETOC publications are produced by task forces composed of appropriate experts drawn from member companies and other organisations.

Subscription details at: <<http://www.ecetoc.org>>

HSDB (Hazardous Substances Databank)

National Library of Medicine, US.

HSDB focuses on the toxicology of potentially hazardous chemicals. It is enhanced with information on human exposure, industrial hygiene, emergency handling procedures, environmental fate, regulatory requirements, and related areas. All data are referenced and derived from a core set of books, government documents, technical reports and selected primary journal literature. HSDB is peer-reviewed by the Scientific Review Panel (SRP), a committee of experts in the major subject areas within the data bank's scope. HSDB is organised into individual chemical records, and contains over 4500 such records.

Free at: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>>

RTECS

National Institute of Occupational Safety & Health (NIOSH).

Registry of Toxic Effects of Chemical Substances (RTECS) provides data for over 130,000 chemicals including identifying information such as CAS number, chemical names and synonyms. Toxicity data include acute and chronic animal tests data, human data, skin and eye irritation data, Threshold Limit Values, IARC determinations, *in vitro* toxicity test data, US National Toxicology Programme (NTP) and TSCA Inventory data. RTECS provides the original reference for each value given.

Subscription details at: <<http://www.cdc.gov/niosh/rtecs.html>>

Toxline

National Library of Medicine, US.

Toxline indexes the literature on pharmacological, biochemical, physiological and toxicological effects of chemicals and provides references and summaries of the literature. Toxline consists of 16 different files, including TSCATS and indexes journals, patents, government reports, criteria documents and meeting reports as well as the IARC (International Agency for Research on Cancer) Monographs and the WHO/ILO/UN sponsored Environmental Health Criteria.

Free at: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?TOXLINE>>

Hazardous substances, toxicity testing, toxicology.

10. GUIDANCE MATERIAL

Use and Selection of PPE

HB 9-1994 Occupational personal protection, Standards Australia, 1994.

This Handbook provides guidance for occupational hygienists, and other occupational health and safety practitioners, training personnel, workshop and laboratory supervisors, industrial relations officers, union officials, members of occupational health and safety committees, students in occupational health and safety courses and other persons concerned with occupational personal protection. This edition refers to more than 50 Australian Standards, as well as many other international and overseas Standards.

Subscription details at: <<http://www.standards.com.au>>

National Code of Practice for the Control of Workplace Hazardous Substances [NOHSC:2007(1994)]. Section 12.16: The use of personal protective equipment as a control measure. Note: includes references to Australian Standards for specific types of PPE.

Free at: <<http://www.nohsc.gov.au/OHSInformation/NOHSCPpublications/fulltext/docs/h6/164.htm>>

APPENDIX 3 - GUIDE FOR SELECTING GENERIC NAMES

1 INTRODUCTORY NOTE

- 1.1 This guide is based on the procedure for naming hazardous substances (division of substances into families) which is described in EEC Council Directive 67/548/EEC.
- 1.2 The families are defined in the following manner:
- (a) 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 section by the atomic number of the chemical element (001 to 013); and
 - (b) organic substances whose properties are identified by having a common functional group as their chief characteristic:
 - (i) the family name is derived from the functional group name; and
 - (ii) these families are identified by the number convention found in section (601 to 650);
 - (c) sub-families bringing together substances with a common specific character have been added in certain cases.

2 ESTABLISHING THE GENERIC NAME

2.1 General principles

- 2.1.1 In selecting a generic name, the following approach is adopted:
- (a) identity of the functional groups and chemical elements present in the molecule; and
 - (b) determine the most important functional groups and chemical elements, which contribute to its properties.
- 2.1.2 The identified functional groups and elements taken into account are the names of families and sub-families.

2.2 Practical application

- 2.2.1 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:

- 1,4-dihydroxybenzene
family 604: phenols and derivatives
generic name: phenol derivative.
- butanols family 603
alcohols and derivatives sub family: aliphatic alcohols
generic name: aliphatic alcohol
- 2-Isopropoxyethanol
family 603: alcohols and derivatives
sub-family: glycolethers
generic name: glycolether

- methacrylate
family 607: organic acids and derivatives
sub-family: acrylates
generic name: acrylate

(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:

- lead hexafluorosilicate
family 009: fluorine compounds
sub-family: inorganic fluorides
family 082: lead compounds
generic name: inorganic lead fluoride
- chlorobenzene
family 602: halogenated hydrocarbons
sub-family: halogenated aromatic hydrocarbons
family 017: chlorine compounds
generic name: chlorinated aromatic hydrocarbon
- 2,3,6-trichlorophenylacetic acid
family 607: organic acids
sub-family: halogenated aromatic acids
family 017: chlorine compounds
generic name: chlorinated aromatic acid
- 1-chloro-1-nitropropane
family 610: chloronitrated derivatives
family 601: hydrocarbons
sub-family: aliphatic hydrocarbons
generic name: chlorinated aliphatic hydrocarbon
- tetrapropyl dithiopyrophosphate
family 015: phosphorus compounds
sub-family: phosphoric esters
family 016: sulfur compounds
generic name: thiophosphoric ester

NB: 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:

- dimercury chloride
family 080: mercury compounds
generic name: inorganic mercury compound
- barium acetate
family 056: barium compounds
generic name: organic barium compound
- ethyl nitrite
family 007: nitrogen compounds
sub-family: nitrites
generic name: organic nitrite
- sodium hydrosulfite
family 016: sulfur compounds
generic name: inorganic sulfur compound

APPENDIX 4 - CRITERIA AND FORM FOR NOTIFICATION OF A GENERIC NAME

CRITERIA

- 1** Information to be provided by the manufacturer or importer of a hazardous substance to NOHSC, where a Type II ingredient is commercially confidential and a generic name is used to protect the confidentiality of the ingredient.
- 2** The manufacturer or importer responsible for placing the hazardous substance on the market shall provide evidence that the divulging of the chemical identity of the preparation on the label or MSDS will place at risk the confidential nature of his/her property.
- 3** Specific factors which need to be considered in determining if a claim to NOHSC for commercial confidentiality should be made include:
 - (a) whether there would be significant detriment to the owner's business if the identity of the substance was disclosed:
 - (i) if so, an explanation should be provided;
 - (b) whether the substance is identified by other than trade or generic names in journals or other public sources. For example, registers, public files of government agencies, patent applications etc;
 - (c) whether the substance has been granted confidential status in another country:
 - (i) if so, information on which countries should be provided;
 - (d) whether the substance has been identified publicly in another country:
 - (i) if so, information should be provided on why granting confidential status in Australia will protect commercial interest;
 - (e) whether the substance has been patented:
 - (i) if so, information should be provided on why granting confidential status will protect commercial interest;
 - (f) whether a public or private disclosure about the substance has been made outside the owner's organisation regarding the importation or manufacture of the substance;
 - (g) whether the owner has taken precautions to prevent disclosure that the substance has been manufactured or imported:
 - (i) if so, information should be provided on what measures have been taken;
 - (h) what the ramifications arising from loss of commercial confidentiality would be;
 - (i) whether it would be practicable for competitors to analyse and duplicate the substance;
 - (j) whether failure to disclose the information would compromise the protection of occupational health, public health or the environment; and
 - (k) the benefits of having public access to this information.
- 4** The generic name used on the label and MSDS must be the same.

- 5** The generic name used should contain enough information about the hazardous substance to ensure risk free handling.
- 6** In order to avoid multiple notifications, only one declaration of confidentiality is necessary if a set of hazardous substances:
 - (a) contain the same hazardous ingredients in the same concentration range;
 - (b) have the same classification and labelling; and/or
 - (c) have the same intended uses.
- 7** The declaration of confidentiality must include all the elements provided for in this form, not forgetting the product name of each substance. A single consistent generic name must be used to protect the chemical identity of the same ingredient under consideration in the case of all the substances referred to.

DECLARATION OF CONFIDENTIALITY				
Name of person responsible for placing substance on market				
Address:				
Phone No:		Fax No:		
Email:		Website:		
Type II ingredients for which confidentiality is proposed and the generic name.				
Composition of hazardous substance (as per NOHSC Code of Practice for Preparation of MSDS [NOHSC:2011])				
CAS NO (or AICS* NO)	Chemical name †	Generic Name	Composition %	
NB: Where ingredients are classified provisionally, accompanying information (bibliographic references) should be provided as evidence that the provisional classification takes account of all existing pertinent information available on the properties of the ingredient. * Australian Inventory of Chemical Substances. † according to international Nomenclature & classification see the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008(1999)].				
Justification for the Confidentiality				
Product name of the hazardous substance				
Is the product name the same for use overseas and in all of Australia? Yes/No				
If NO, specify the product name used overseas and in the different jurisdictions.				
Overseas (specify)	NSW	VIC	QLD	SA
TAS	NT	ACT	Commonw'lth	WA
Classification of the hazardous substance(s) according to the National Occupational Health and Safety Commission's <i>Approved Criteria for Classifying Hazardous Substances</i> [NOHSC:1008(1999)].				
Intended uses for the hazardous substance(s)				
Labelling of the substance(s) according to the National Occupational Health and Safety Commission's <i>National Code of Practice for the Labelling of Workplace Substances</i> [NOHSC:2012(2001)]. <u>Attach example of label.</u>				
Material Safety Data Sheet(s) conforming to the National Occupational Health and Safety Commission's <i>National Code of Practice for the Preparation of Material Safety Data Sheets</i> [NOHSC:2011]. <u>Attach MSDS.</u>				
Signature:		Date:		

APPENDIX 5 - SAMPLE CONFIDENTIALITY AGREEMENT FOR DISCLOSURE OF COMMERCIALY CONFIDENTIAL INFORMATION

IN CONSIDERATION of my being given access to confidential information concerning [... insert description of confidential information to be released...], for the purposes of [... insert the purpose of the release of the confidential information...].

I hereby undertake as follows:

- 1.** That, except insofar as is necessary to achieve the above purpose, I will not divulge or communicate any of the confidential information to any other person.
- 2.** That I will not use the confidential information for any other purpose than the purpose for which the confidential information was released.
- 3.** That I will provide a secure storage environment for the confidential information and will institute and maintain an effective control of access to the confidential information until such time as it is destroyed after the specific purpose for which the information was released has been completed.

GIVEN by me (signature of recipient)
..... (print name and position)
in the presence of (signature of witness)
..... (print name and position)

at(place of signature) on(date of signature)