



# **Guide to Standards - Dangerous Goods**

---

**Your snapshot of Australian Standards®  
and Certification**

## Table of Contents

<b>Introduction</b> .....	<b>3</b>
<b>General Information</b> .....	<b>3</b>
Storing Dangerous Goods .....	4
Transporting Dangerous Goods and Emergency Response Guides .....	4
<b>Aerosols</b> .....	<b>6</b>
Storing Aerosols .....	6
<b>Batteries</b> .....	<b>6</b>
Manufacturing Standards.....	6
Storing Batteries .....	7
<b>Cigarette Lighters</b> .....	<b>7</b>
Manufacturing Standards.....	7
Storing Cigarette Lighters .....	7
<b>Explosives</b> .....	<b>7</b>
Storing Explosives .....	7
<b>Gases</b> .....	<b>8</b>
Storing Gases .....	8
Gas Cylinders .....	8
Gas Distribution Networks .....	10
Gas and Liquid Petroleum Pipelines.....	10
Oxygen and Gas Reticulation Systems.....	11
Pipelines Dispensing Beverages .....	11
<b>Vehicle Gas Conversions</b> .....	<b>11</b>
<b>Laboratory and Medical Gases</b> .....	<b>12</b>
Medical Gas Pipelines .....	12
Toxic and Infectious Substances .....	12
Storage .....	12
<b>Lubricants and Oils</b> .....	<b>12</b>
Storing Lubricants .....	12
Manufacturing Standards for Lubricants .....	12
<b>Flammable and Combustible Liquids</b> .....	<b>14</b>
<b>Oxidizing Substances and Organic Peroxides</b> .....	<b>14</b>
<b>Radioactive Substances</b> .....	<b>14</b>
<b>Corrosive Substances</b> .....	<b>14</b>
<b>Paints</b> .....	<b>15</b>
Storing Paints .....	15
<b>Tanks and Containers</b> .....	<b>15</b>
Storing Dangerous Goods in Tanks and Containers.....	15
Manufacturing Standards.....	16
<b>Miscellaneous Dangerous Goods</b> .....	<b>17</b>
<b>SAI Global Product Certification Schemes</b> .....	<b>18</b>
<b>Online Resources</b> .....	<b>19</b>
<b>Regulators</b> .....	<b>20</b>
LP Conversion Regulators.....	20
Chemical Safety Regulators .....	20
Gas Regulators.....	20
<b>Customer Service Contacts</b> .....	<b>21</b>

## Introduction

This document provides information on Standards and other industry specific information that may be of interest to anyone working with different types of dangerous goods, including manufacturers, importers, suppliers and users. The publications outlined in this guide cover requirements for dangerous goods transported by road and rail.

Organizations and personnel transporting dangerous goods by ship and air should follow the procedures covered in:

- Transporting dangerous goods by air  
[IATA Dangerous Goods \(HAZMAT\) Regulation](#)
- Transporting dangerous goods by ship  
[International Maritime Dangerous \(IMDG\) Code](#)



An invaluable resource which applies to the handling and transport of dangerous goods is **HB 76:2010, Dangerous Goods – Initial Emergency Response Guide**. This Standard is consistently mentioned throughout this guide and it provides information on dealing with accidents, spills, leaks, hazards or fires involving dangerous goods and the protective clothing to be worn in emergency procedures.

## General Information

Dangerous goods supplied in Australia and New Zealand should be classified, labelled, packaged, stored and transported according to Australian Standards® which include the following classes:

- Class 1 - Dangerous Goods - Explosives
- Class 2 - Dangerous Goods - Gases
- Class 3 - Dangerous Goods - Flammable Liquids
- Class 4 - Dangerous Goods - Flammable Solids; Substances Liable to Spontaneous Combustion; Substances which in Contact with Water, Emitting Flammable Gases
- Class 5 - Dangerous Goods - Oxidizing Substances and Organic Peroxides
- Class 6 - Dangerous Goods - Toxic and Infectious Substances
- Class 7 - Dangerous Goods - Radioactive Material
- Class 8 - Dangerous Goods - Corrosive Substances
- Class 9 - Dangerous Goods - Miscellaneous Dangerous Goods and Articles

More general information on dangerous goods is also available from [Safe Work Australia](#).

Personnel responsible for supplying dangerous goods and transporting them by road and rail should follow the procedures outlined in the 7th edition of the [Australian Dangerous Goods Code \(ADG\)](#). A list of Australian Standards® is included in Volume 1 of this code. This code is also based on the [UN Recommendations on the Transport of Dangerous Goods - Model Regulations Fourteenth revised edition](#). For more information on this topic refer to the [Transporting Dangerous Goods](#) section of this guide.

Industrial chemicals sold and used in Australia and New Zealand need to be registered and assessed by the [National Industrial Chemicals Notification and Assessment Scheme - NICNAS](#) under the [Australian Inventory of Chemical Substances \(ACIS\)](#). Agricultural and veterinary chemicals (e.g. pesticides and herbicides) need to be registered and assessed by the [Australian Pesticides and Veterinary Medicines Authority \(APVMA\)](#).

Dangerous goods supplied in Australia and New Zealand should be marked with UN numbers, class numbers and HAZCHEM codes. Some classes of dangerous goods are also classified according to packaging groups.

### UN Numbers

United Nations (UN numbers) consist of 4 digits and they can be found in the publications below:

- **HB 76:2010, Dangerous Goods – Initial Emergency Response Guide**
- [Australian Dangerous Goods Code \(ADG\)](#)
- [UN Manual of Tests and Criteria](#)

### Class Numbers

Information on methods used to label dangerous goods by class according to appropriate criteria is included in **AS 1216-2006, Class labels for dangerous goods**. Packaging groups for dangerous goods can be assessed by completing the types of tests that are included in the **AS 2106, Methods for the determination of the flash point of flammable liquids (closed cup) Series**.

### HAZCHEM Numbers

Different types of dangerous goods are also designated with three digit alpha-numeric codes providing initial emergency response information for different classes of dangerous goods. These codes are termed HAZCHEM numbers and information on this coding system is summarized in **HB 76:2010**.

## Storing Dangerous Goods

Standards covering storage and handling requirements for dangerous goods are regulated by State Workplace Health and Safety Authorities, [Safe Work Australia](#) and [Competent Authorities for Road and Rail Transport](#).

Miscellaneous (class 9) types of dangerous goods used and located on farms should be stored by meeting the requirements outlined in:

- Australian farms - **AS 2507-1998, The storage and handling of agricultural and veterinary chemicals**.
- New Zealand farms - **NZS 8409:2004, Management of agrichemicals**.

Dangerous goods located in ports should be stored by following the procedures described in **AS 3846-2005, The handling of dangerous goods in port areas**.

## Transporting Dangerous Goods and Emergency Response Guides

Organizations and personnel transporting dangerous goods by road and rail should follow the techniques described in [Australian Dangerous Goods Code \(ADG Code\)](#). This code also indicates that organizations transporting dangerous goods should have one of the following publications in each of their vehicles:

- **HB 76:2010, Dangerous Goods - Initial Emergency Response Guide**
- **AS 1678, Emergency procedure guide - Transport Series**
- **AS 1678.0.0.001-2004, Emergency procedure guide - Transport - - Vehicle fire**
- **AS 1678.2A1-2004, Emergency procedure guide - Transport - Group text EPG for Class 2 substances - Flammable, compressed gas**

Organizations and personnel transporting explosives (including fireworks) should consult the [Australian Code for the Transport of Explosives by Road and Rail](#). The code is regulated by Government bodies who are members of the [Australian Forum of Explosives Regulators](#).



Please note: In cases where organizations are transporting 'limited quantities' of dangerous goods the above publications may not be required. For information on this, please consult the [Australian Dangerous Goods Code \(ADG Code\)](#). Appropriate advice may also be available from [Competent Authorities for Road and Rail Transport](#).

Emergency procedure guides are not available for all classes of dangerous goods (such as radioactive substances). In cases where no emergency procedures are available, organizations and personnel transporting dangerous should ensure each vehicle transporting dangerous goods has a copy of **HB 76:2010**. This Handbook includes information on the below:

- The latest United Nations (UN) numbers
- Up-dated guide numbers
- A new guide 52 covering requirements for desensitized explosives
- New technical names, including military designations for terrorist materials
- Text changes to reflect the joint Australia/New Zealand status of the handbook
- A summary of the six steps that should be followed to manage emergencies for dangerous transported by road

**AS 1678, Emergency procedure guide - Transport Series** includes information on transportation documentation requirements for particular classes of dangerous goods. The title of these publications include the Standard designation, followed by the class of dangerous good (e.g. AS 1678.3.1.001-2003 - AS 1678 is the Standard designation and 3.1 is the Class).

#### Dangerous Goods Classes where there are 'Current' Standards

- Class 2.1 - Flammable gases  
**AS 1678.2A1-2004, Emergency procedure guide – Transport – Group text EPG for Class 2 substances – Flammable, compressed gas** and **AS 1678.2D1-1998, Emergency procedure guide – Transport – Group text EPGs for Class 2 substances – Compressed and liquefied gases – Aerosols**
- Class 2.2 - Non-flammable and Non-toxic gases  
**AS 1678.2C1-2004, Emergency procedure guide – Transport – Group text EPGs for Class 2 substances – Non-flammable, compressed gas**
- All types of Class 2 gases  
**AS 1678.2M1-2004, Emergency procedure guide - Transport - Group text EPGs for Class 2 substances - Compressed and liquefied gases - Mixed load of gases in cylinders**
- Class 3 - Flammable liquids  
**AS 1678.3A1-2004, Emergency procedure guide – Transport – Group text EPGs for Class 3 substances – Flammable liquids**
- Class 5.1 - Oxidizing substances  
**AS 1678.5A1-2006, Emergency procedure guide – Transport Group text EPG for Class 5 substances – Oxidizing agents**
- Class 5.2 - Organic peroxide
- **AS 1678.5K1-2006, Emergency procedure guide – Transport – Group text EPGs for Class 5 substances – Organic peroxides** and **AS 1678.5Q1-2006, Emergency procedure guide – Transport – Group text EPGs for Class 5 substances – Organic peroxides, temperature controlled**

- Class 8 - Corrosive Substances  
**AS 1678.8A1-2004, Emergency procedure guide – Transport – Group text EPGs for Class 8 substances – Corrosive substances**

### Dangerous Goods Classes where there are No ‘Current’ Standards

- Class 4 Dangerous Goods - Flammable Solids; Substances Liable to Spontaneous Combustion; Substances which in Contact with Water, Emitting Flammable Gases
- Class 6 Dangerous Goods - Toxic and Infectious Substances
- Class 7 Dangerous Goods - Radioactive Material

## Aerosols

Aerosol containers used in Australia and New Zealand should be designed, manufactured, labelled, packaged and tested to the requirements covered in **AS 2278.1-2008, Aerosol containers – Metal aerosol dispensers of capacity 50 mL to 100 mL inclusive.**

### Storing Aerosols

Aerosol containers are classified as flammable gases. Large quantities of flammable gases should be stored by following the procedures described in **AS 4332-2004, The storage and handling of gases in cylinders.**

More general information on this topic can be found in the [Storing Dangerous Goods](#) section of this guide.

## Batteries

### Manufacturing Standards

#### Primary Batteries

Primary batteries are usually disposable and they are mostly used with consumer products. Standards Australia has not established any Standards on manufacturing, safety and labelling requirements for primary batteries. However this information is included in the **IEC 60086, Primary batteries Series** and **I.S. EN 60086, Primary batteries Series.**

#### Secondary Batteries

Secondary batteries are designed to be recharged and they can be used in a variety of applications. Secondary batteries used to provide back-up power supply in buildings should be manufactured to **AS 4086.1-1993, Secondary batteries for use with stand-alone power systems – General requirements** and maintained by following the details outlined in **AS 4086.2-1997, Secondary batteries for use with stand-alone power systems – Installation and maintenance.**

Secondary batteries designed to be recyclable should be marked with the International Recycling symbol and information on this is included in **IEC 61429 Ed 1.0, Marking of secondary cells and batteries with the international recycling symbol ISO 7000-1135** or **I.S. EN 61429:1997, Marking of Secondary Cells and Batteries With The International Recycling Symbol ISO 7000-1135 and Indications Regarding Directives 98/86/eec and 91/57/eec.**

#### Starter Batteries

Starter batteries used with vehicles should be tested to meet the requirements outlined in **AS 2149-2003, Starter batteries – Lead-acid.**

## Storing Batteries

Batteries are classified as corrosive substances. Organizations and personnel storing industrial and commercial quantities of corrosive substances should follow the procedures described in **AS 3780-2008, The storage and handling of corrosive substances**. Eyewash facilities used in areas where corrosive substances are being used should conform to the requirements defined in **AS 4775-2007, Emergency eyewash and shower equipment**.

Battery rooms should be designed to meet the requirements outlined in the **AS 3011, Electrical installations - Secondary batteries installed in buildings Series** and **AS 2676, Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings Series** which includes recommended airflow requirements for battery rooms storing vented and sealed batteries.

Secondary batteries are commonly used with forklifts. Information on recommended requirements for facilities where these types of batteries are charged is included in **AS 2359.6-1995, Powered industrial trucks – Safety code**.

More general information on this topic is available in the [Storing Dangerous Goods](#) section of this guide.

## Cigarette Lighters

### Manufacturing Standards

Manufacturing and safety requirements for cigarette lighters supplied in Australia and New Zealand are included in the **AS/NZS 4867, Cigarette Lighters Series**.

### Storing Cigarette Lighters

In terms of dangerous goods, butane used with cigarette lighters is classified as a cryogenic flammable gas. Organizations and personnel storing large quantities of flammable gases stored in cylinders should follow the procedures outlined in **AS 4332-2004, The storage and handling of gases in cylinders**.

More general information on this topic is available in the [Storing Dangerous Goods](#) section of this guide.

## Explosives

Definitions for terms covering requirements for different types of explosives is included in **AS 2187.0-1998, Explosives – Storage, transport and use – Terminology**.

Information on packaging and labelling details for different types of explosives is included in **AS 1216-2006, Class labels for dangerous goods**.

Information on methods used to manufacture, store and transport different types of fireworks is included in **AS 2187.3-1999, Explosives – Storage, transport and use – Pyrotechnics – Shopgoods fireworks – Design, performance and testing** and **AS 2187.4-1998, Explosives – Storage, transport and use – Pyrotechnics – Outdoor displays**.

### Storing Explosives

Organizations and personnel storing explosives should follow the procedures that are described in **AS 2187.1-1998, Explosives – Storage, transport and use – Storage** and **AS 2187.2-2006, Explosives – Storage and use – Use of explosives**. **AS 2187.2-2006** does not include information on storage and handling requirements for the types of explosives listed below:



- Safety ammunition
- Propellant powders
- Pyrotechnics (Fireworks)
- Military Explosives

More detailed information on this is available in the [Storing Dangerous Goods](#) section of this guide.

## Gases

### Storing Gases

Personnel storing commercial and industrial quantities of different gases stored in cylinders in one area should follow the methods described in **AS 4332-2004, The storage and handling of gases in cylinders**. This Standard covers storage and handling requirements for the types of dangerous good classes:

- Class 2.1 - Flammable gases
- Class 2.2 - Non-flammable, non-toxic gases
- Class 2.3 - Toxic gases

Personnel storing only one type of gas in one area should follow the details outlined in:

- **AS/NZS 1596:2008, The storage and handling of LP Gas**
- **AS 1894-1997, The storage and handling of non-flammable cryogenic and refrigerated liquids**
- **AS/NZS 2022:2003, Anhydrous ammonia – Storage and handling**
- **AS/NZS 2927:2001, The storage and handling of liquefied chlorine gas**
- **AS 3961-2005, The storage and handling of liquefied natural gas**

More general information on this topic is available in the [Storing Dangerous Goods](#) section of this guide.

### Gas Cylinders

Refillable gas cylinders used to store compressed, dissolved and liquefied gases with water capacities ranging from 0.1kg to 150kg are used for a wide variety of purposes. Gas cylinders with capacities up to 25kg are commonly used for gas barbecues. Gas cylinders with larger capacities may be used in situations where reticulated gas is not supplied to household premises.

All types of gas cylinder testing stations should be in possession of the types of Standards listed throughout this section. Owners and operators of service stations should follow the requirements outlined in **AS 1940-2004, The storage and handling of flammable and combustible liquids** and **AS 4976-2008, The removal and disposal of underground petroleum storage tanks**.

### Designing, Manufacturing and Testing Gas Cylinders

Manufacturers, importers and suppliers of refillable gas cylinders should arrange tests to relevant Standards before selling their products in Australia and New Zealand. Information on labelling requirements for cylinders used for different applications is also included in **AS 4484-2004, Gas cylinders for industrial, scientific, medical and refrigerant use – Labelling and colour coding**.

Refillable gas cylinders that are designed not to store acetylene, with water capacities ranging from 0.1kg to 3000kg should meet the requirements in **AS 2030.1-2009, Gas cylinders - General**



**requirements.** Design and manufacture requirements of foreign cylinders imported for filling and immediate export, or imported full for use and exported for refilling is also included in this Standard. Cylinders designed to store dissolved acetylene should be manufactured to **AS 2527-2006, Cylinders for dissolved acetylene.**

Steel cylinders sold, supplied and refilled in Australia and New Zealand should be designed to meet the requirements covered in:

- **AS 2469-2005, Steel cylinders for compressed gases – Welded two-piece construction – 0.1kg to 150kg**
- **AS 2470-2005, Steel cylinders for compressed gases – Welded three-piece construction with longitudinal joint - 11kg to 150kg**
- **AS 3577-2006, Steel cylinders for compressed gases – Welded – 150kg to 500kg**

Hoop wrapped cylinders supplied in Australia and New Zealand should be tested to meet requirements outlined in **AS 2764-2002, Fibre reinforced plastics (FRP) aluminium alloy gas cylinders – Hoop overwrapped.**

Aluminium cylinders sold, supplied and used in Australia and New Zealand should be designed to conform to:

- **AS 2875-1995, Alloy steel cylinders for compressed gases – Seamless 0.1kg to 500kg**
- **AS 1777-2005, Aluminium cylinders for compressed gases – Seamless 0.1 kg to 130kg**

Regulators used with gas cylinders in industrial applications should be manufactured and tested to **AS 4267-1995, Pressure regulators for use with industrial compressed gas cylinders.** Valves used with gas cylinders should be tested to the **AS 2473, Valves for compressed gas cylinders Series.**

Gas cylinders, tanks, containers or bottles filled with LP gas for vehicle conversions should be designed and manufactured to the requirements specified in **AS/NZS 3509-2009, LP Gas fuel vessels for automotive use.**

### **Decanting (Emptying) and Refilling Gas Cylinders**

Cylinders should be refilled and inspected by following the methods described in **AS 2030.5-2009, Gas cylinders – Filling, inspection and testing of refillable cylinders.** Additional information on filling and inspection requirements for cylinders containing acetylene and welded insulated cylinders is included in:

- **AS 2030.1-2009, Gas cylinders - General requirements**
- **AS 2030.2-1996, The verification, filling, inspection and maintenance of cylinders for the storage and transport of compressed gases – Cylinders for dissolved acetylene**
- **AS 2030.4-1985, The verification, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases – Welded cylinders – Insulated**

Cylinders containing medical air and oxygen should be decanted and filled by following the procedures that are described in **AS 3848.1-1999, Filling of portable gas cylinders – Decant filling of medical air and oxygen into portable cylinders – Safe procedures.**

Design and manufacture requirements of foreign cylinders imported for filling and immediate export, or imported full for use and exported for refilling is included in **AS 2030.1-2009, Gas cylinders - General requirements.**

Diving (SCUBA) cylinders and cylinders used for non-underwater breathing (SCBA) should be decanted and filled by the methods prescribed in **AS 3848.2-1999, Filling of portable gas cylinders – Filling of portable cylinders for self-contained underwater breathing apparatus (SCUBA) and non-underwater self-contained breathing apparatus (SCBA) – Safe procedures.**

Gas Cylinder Testing Stations should be used to inspect cylinders at regular intervals. Information on procedures that should be followed by Gas Cylinder Testing Stations is included in the **AS 2337, Gas cylinder test stations Series.**



For further information on the [Gas Cylinder Testing Certification Scheme](#) you can refer to the [SAI Global Product Certification Schemes](#) section of this guide or contact SAI Global [Product Certification Services](#) Group on the following:  
Phone: +61 2 8206 6322  
Email: [product@saiglobal.com](mailto:product@saiglobal.com)

## Gas Distribution Networks

Organizations responsible for managing gas distribution networks should follow the procedures recommended in the **AS/NZS 4645, Gas distribution networks Series.** For organizations responsible for the distribution and reticulation of liquefied petroleum (LP) should follow the procedures outlined in **AS/NZS 1596:2008, The storage and handling of LP Gas.**

Steel pipelines with hoop stresses greater than 20% are included in **AS 2885.1-2007, Pipelines - Gas and liquid petroleum - Design and construction.**

## Gas and Liquid Petroleum Pipelines

Gas and liquid petroleum pipelines used on land or sea (offshore platforms) should be designed by following the details that are included in **AS 2885.0-2008, Pipelines – Gas and liquid petroleum – General requirements** and **AS 2885.1-2007, Pipelines – Gas and liquid petroleum – Design and construction.** These Standards only cover requirements for pipelines designed to convey single-phase and multi-phase hydrocarbon fluids. A detailed diagram providing information on these types of pipelines is also included in **AS 2885.0-2008.**

Submarine pipelines should be designed by following the details outlined in **AS 2885.4-2010, Pipelines – Gas and liquid petroleum – Submarine pipeline systems.**

Gas and liquid petroleum pipelines should be welded by following the procedures that are recommended in **AS 2885.2-2007, Pipelines – Gas and liquid petroleum – Welding.**

Operational and maintenance requirements that should be followed by organizations and personal using gas and liquid petroleum pipelines are included in **AS 2885.3-2001, Pipelines – Gas and liquid petroleum – Operation and maintenance.**

Marking details for pipelines conveying different types of gases and liquids is included in **AS 1345-1995, Identification of the contents of pipes, conduits and ducts.**

Installation and consumer piping for fuel gases (including town gas, natural gas, liquefied petroleum gas in a vapour phase, tempered liquefied petroleum gas, simulated natural gas, or similar substance) is included in **AS 5601, Gas installations Series** (also known as AG 601). This Series is also available in **AS/NZS 5601 SET:2010 Gas installations Set.** Gas systems connected to LP cylinders are covered in **AS/NZS 1596:2008.**

## Underground Pipelines only conveying Petroleum

Organizations and personnel designing, installing, operating, maintaining and repairing underground pipelines conveying petroleum products and oils should follow the types of practices that are

described in **AS 4897-2008, The design, installation and operation of underground petroleum storage systems**. A checklist that should be followed by personnel operating and maintaining underground petroleum storage pipelines is also included in this Standard.

## Oxygen and Gas Reticulation Systems

Gas reticulation systems are primarily used to supply gases for industrial, laboratory and medical applications.

Oxygen and acetylene piping and reticulation systems used in Australia should be designed to meet the requirements specified in **AS 4289-1995, Oxygen and acetylene gas reticulation systems**.

Gas cylinders used with oxygen and gas reticulation systems should be designed and manufactured to the requirements specified in **AS 2030.1-2009, Gas cylinders - General requirements**. Design and manufacture requirements of foreign cylinders imported for filling and immediate export, or imported full for use and exported for refilling can found in this Standard.

Regulators used with gas reticulation systems operating at less than 2400 kPa should be manufactured to **AS 4840-2001, Low pressure regulators for use in industrial compressed gas reticulation systems**. Regulators with gas reticulation systems operating at pressures greater than 240 kPa should be manufactured to **AS 4267-1995, Pressure regulators for use with industrial compressed gas cylinders**.

Pressure relief valves used with gas reticulation systems should be manufactured to **AS 1271-2003, Safety valves, other valves, liquid level gauges, and other fittings for boilers and unfired pressure vessels**. These types of valves should be installed by following the methods outlined in **AS 3892-2001, Pressure equipment – Installation**.

## Pipelines Dispensing Beverages

Gas piping systems used to dispense beverages should be designed, tested, installed and commissioned by following the details outlined in **AS 5034-2005, Installation and use of inert gases for beverage dispensing**. This Standard covers requirements for non-toxic and non-flammable (class 2.2) compressed gases. A table listing requirements for inert gas systems used to dispense beverages commonly found in hotels, restaurants and pubs is also included in this Standard.

## Vehicle Gas Conversions

Organizations and personnel responsible for connecting LP gas fuel systems to vehicles should follow the procedures outlined in **AS/NZS 1425:2007 LP Gas fuel systems for vehicle engines**.

Cylinders, pressure vessels and tanks used to store LP gas for vehicle conversions should be designed and manufactured to the requirements specified in **AS/NZS 3509:2009, LP Gas fuel vessels for automotive use**. Pressure vessels used for LP conversions are classified as serially produced pressure vessels and these should be designed and manufactured to the requirements defined in **AS 2971-2007, Serially produced pressure vessels**.

Information on recommended ventilation rates for areas where vehicle conversions are being undertaken is included in **AS/NZS 1425:2007**. This Standard also includes information on compliance plates that should be placed on cylinders, tanks and pressure vessels used for LP conversions.

Information on recommended safe work practices (including recommended signs that should be worn by personnel engaged in these types of activities) should be followed by persons doing LP and Compressed Natural Gas (CNG) conversions are outlined in **AS 2746-2008, Working areas for gas-fuelled vehicles**. This Standard also includes information on ventilation of service pits used to undertake gas conversions.

CNG refuelling stations should be designed, operated and maintained by following the recommendations described in **AS 5092-2009, CNG refuelling stations**.

Personnel connecting Liquefied Petroleum and CNG gases to industrial equipment should follow the types of techniques that are described in **AS 4983-2010, Gas fuel systems for forklifts and industrial engines**.

Natural Gas (NG) fuel systems for mounted on vehicle engines should be designed and constructed to meet the requirements of **AS/NZS 2739:2009, Natural gas (NG) fuel systems for vehicle engines**.

## Laboratory and Medical Gases

### Medical Gas Pipelines

Medical gas pipelines supplying non-flammable gases should be designed, tested, operated and installed by following the information that is included in **AS 2896-1998, Medical gas systems – Installation and testing of non-flammable medical gas pipeline systems**. This Standard covers requirements for piped vacuum and venturi ejector suction system. Standards Australia has not established any Standards covering requirements for pipelines that are designed to store flammable medical gases.

### Toxic and Infectious Substances

Toxic (Class 6.1) substances should be stored and handled by following the details outlined in **AS/NZS 4452:1997, The storage and handling of toxic substances**. The storage and handling Standard for infectious (Class 6.2) substances is included in **AS/NZS 3816:1998, Management of clinical and related wastes**. There is also a handbook available to this Standard called **HB 202-2000, A management system for clinical and related wastes – Guide to the application of AS/NZS 3816-1998, Management of clinical and related wastes**.

### Storage

Methods for storing gases located in laboratories should follow the requirements outlined in:

- **AS/NZS 2243.2:2006, Safety in laboratories – Chemical aspects**
- **AS/NZS 2243.6:2010, Safety in laboratories – Plant and equipment aspects**
- **AS/NZS 2243.10:2004, Safety in laboratories – Storage of chemicals**

## Lubricants and Oils

Lubricants have different types of properties and can be used for a wide variety of applications. Lubricants that are classified with UN numbers are deemed to be dangerous goods.

### Storing Lubricants

Organizations and personnel responsible for commercial and industrial quantities of lubricants and oils should follow the procedures outlined in **AS 1940-2004, The storage and handling of flammable and combustible liquids**. More general information on this topic is available by referring to the [Storing Dangerous Goods](#) section of this guide.

### Manufacturing Standards for Lubricants

Standards Australia has not established any Standards covering manufacturing requirements for lubricants. The International Organization for Standardization (ISO) is responsible for preparing

Standards covering characteristics and properties for lubricants, solvents, fuels, waxes and bitumen products used for different applications. Lubricants and industrial oils are designed with the letter L.

International Standards cover both slideway lubricants and lubricants manufactured from mineral oils. Slideway lubricants are typically used with machine tools and they are designed to provide a surface that is stable under loads. Lubricants manufactured from mineral oils are commonly used with engines and provide high levels of protection against rust and oxidation.

A diagram summarizing classes and viscosity grades for the lubricants, gas oils and marine oils is included in **ISO 8681-1986, Petroleum products and lubricants – Method of classification – Definition of classes**. A table listing codes used to designate different types of lubricants, industrial oils and related products is included in **ISO 6743-99:2002, Lubricants, industrial oils and related products (class L) – Classification – Part 99: General**. More detailed information on classification requirements for all types of lubricants is included in the **ISO 6743, Lubricants, industrial oils and related products (class L) - Classification Series**.

Information on manufacturing and performance requirements for lubricants used for different applications is included in the Standards referenced below:

- Lubricants for Engine Oils  
**ISO 13738:2000, Lubricants, industrial oils and related products (class L) – Family E (Internal combustion engine oils) – Specification for two-stroke-cycle gasoline engine oils (categories EGB, EGC and EGD) and ISO 24254:2007, Lubricants, industrial oils and related lubricants (class L) – Family E (internal combustion engine oils) – Specifications for oils for use in four-stroke cycle motorcycle gasoline engines and associated driveways (categories EMA and EMB)**
- Lubricants for Gears  
**ISO 12925-1:1996, Lubricants, industrial oils and related products (class L) – Family C (gears) – Gears: Part 1: Specifications for lubricants for enclosed gear systems**
- Lubricants for Hydraulic Systems
  - Anti-Rust and Anti-Oxidation Properties  
**ISO 11158:2009, Lubricants, industrial oils and related products (class L) - Family H (hydraulic systems) - Specifications for categories HH, HL, HM, HV and HG**
  - Fire Resistant Properties  
**ISO 12922:1999, Lubricants, industrial oils and related products (class L) - Family H (Hydraulic systems) - Specifications for categories HFAE, HFAS, HFB, HFC, HFDR and HFDU**
  - Environment Friendly Lubricants  
**ISO 15380:2002, Lubricants, industrial oils and related products (class L) - Family H (Hydraulic systems) - Specifications for categories HETG, HEPG, HEES and HEPR**
- Lubricants for Turbines  
**ISO 8068:2006, Lubricants, industrial oils and related products (class L) – Family T (Turbines) – Specification for lubricating oils for turbines; ISO 10050:2005, Lubricants, industrial oils and related products (class L) – Family T (Turbines) – Specifications for triaryl phosphate ester turbine control fluids (category ISO-L-TCD); and ISO 4261:1993, Petroleum products – Fuels (class F) – Specifications of gas turbine fuels for industrial and marine applications**
- Lubricants for Machining  
**ISO 19378:2003, Lubricants, industrial oils and related products (class L) – Machine-tool lubricants – Categories and specifications**



- Lubricants for Metalworking  
**ISO/TS 12927:1999, Lubricants, industrial oils and related products (class L) – Family M (Metalworking) – Guidelines for establishing specifications.** (Note: this Standard covers requirements for non-aqueous and water–miscible metalworking fluids)

## Flammable and Combustible Liquids

**AS 1940-2004, The storage and handling of flammable and combustible liquids** provides information on storage and handling requirements for flammable and combustible liquids. Storage and handling requirements for these types of dangerous goods are linked to packaging groups.

Flashpoint and viscosity tests are used to classify flammable and combustible liquids into groups. These types of tests are included in the **AS 2106, Methods for the determination of the flash point of flammable liquids (closed cup) Series**. Viscosity tests for flammable liquids substances are also included in **ASTM D4359-90(2006), Standard Test Method for Determining Whether a Material is a Liquid or a Solid**. Suspension tests used to determine non-volatile content levels for paints are included in **AS 1580.301.1-2005, Paints and related tests – Methods of test – Non-volatile content by mass**.

Minor quantities of flammable and combustible liquids located in different areas should be stored by following the procedures that are described in **AS 1940-2004**. This Standard also covers information on methods used to store larger quantities of flammable and combustible liquids.

Information on requirements for fire-resistant separating walls (also known as bunds) used to store flammable and combustible liquids is also included in **AS 1940-2004**. Fire resistance tests for bunds and other types of building materials are determined by completing the types of tests that are included in **AS 1530.4:2005, Methods for fire tests on building materials, components and structures – Fire-resistance test of elements of construction**.

Standards Australia has not established any manufacturing Standards for bund walls, however materials used to manufacture these types of structures can be designed to conform to the **BSI 7959, Materials used for the control of liquid spillages Series**. Bunds that have been designed to this British Standard should also be tested to **AS 1530.4:2005**.

## Oxidizing Substances and Organic Peroxides

Information on storage and handling requirements for Class 5.1 oxidizing substances is included in **AS 4326-2008, The storage and handling of oxidizing agents**. Organic peroxides (Class 5.2) dangerous goods should be stored and handled by following the details outlined in **AS 2714-2008, The storage and handling of organic peroxides**.

## Radioactive Substances

Standards Australia has not established any Standards covering storage and handling requirements for radioactive substances, for information on this topic please contact the Australian Government [Australian Radiation Protection and Nuclear Safety Agency](#).

## Corrosive Substances

Corrosive substances should be stored and handled by following the methods outlined in **AS 3780-2008, The storage and handling of corrosive substances**.

## Paints

Paints supplied in Australia and New Zealand may be classified as flammable liquids, however there are some types of paints that are non-toxic, non-flammable and environmentally friendly. Flashpoint and viscosity tests are used to determine categories for different types of flammable liquids. Paints classified as flammable liquids should be designated with UN numbers.

Paints supplied in aerosol containers should conform to **AS 2278.1-2008, Aerosol containers - Metal aerosol dispensers of capacity 50 mL to 1000 mL inclusive**. Properties for different types of paints can be determined by completing tests that are included in the **AS/NZS 1580, Paints and related materials - Methods of test Series** and **AS/NZS 3730, Guide to the properties of paints for buildings Series**.

Suspension tests used to determine non-volatile content levels for paints are included in **AS 1580.301.1-2005, Paints and related tests – Methods of test – Non-volatile content by mass**

**AS 1216-2006, Class labels for dangerous goods** includes information on labelling requirements for flammable liquids. Information on packaging and labelling requirements for paints is included in the [Uniform Schedules for Drugs and Poisons](#) which has been created by the Australian Government Department of Health and Ageing Therapeutic Goods Administration.

## Storing Paints

Organizations and personnel responsible for commercial and industrial quantities of lubricants and oils should follow the procedures outlined in **AS 1940-2004, The storage and handling of flammable and combustible liquids**.

More general information on this topic is available in the [Storing Dangerous Goods](#) section of this guide.

## Tanks and Containers

Standards covering storage, transportation and manufacturing requirements for tanks and containers that are designed to store dangerous goods cover requirements for freight containers, above ground tanks, underground tanks and road tankers.

Organizations and personnel responsible for removing and disposing of underground petroleum storage tanks should follow the procedures recommended in **AS 4976-2008, The removal and disposal of underground petroleum storage tanks**.

Steps and platforms used with tanks should conform to the requirements in **AS 1657-1992, Fixed platforms, walkways, stairways and ladders – Design, construction and installation**.

## Storing Dangerous Goods in Tanks and Containers

Personnel working with and storing mixed classes of dangerous goods in packages and intermediate bulk containers (also known as freight containers) should follow the methods described in:

- **AS/NZS 3833:2007, The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers** which covers minimum requirements for the storage and handling of more than one class of dangerous goods in packages or intermediate bulk containers (IBCs) (also known as freight containers) with capacities up to 1.6 m<sup>3</sup>. This Standard should not be used to store radioactive substances
- **AS/NZS 4681-2000, The storage and handling of Class 9 (miscellaneous) dangerous goods and articles** differs from the requirements covered in **AS/NZS 3833:2007** as it can only be used in instances where Class 9 dangerous goods are stored in bulk containers and packaged stores



Dangerous goods located in ports should be stored by following the procedures described in **AS 3846-2005, The handling of dangerous cargoes in port areas**.

More general information on this topic is available in the [Storing Dangerous Goods](#) section of this guide.

## Manufacturing Standards

### Above Ground Storage Tanks

Steel horizontal, rectangular and vertical tanks used to store flammable and combustible liquids should be manufactured to the requirements defined in **AS 1692-2006, Steel tanks for flammable and combustible liquids**. This Standard also includes a detailed summary of information that should be provided by tank manufacturers.

Vertical tanks of any size may also be manufactured to the European and American Standards below:

- **API 620 Ed. 11 (2008), Design and Construction of Large, Welded, Low-Pressure Storage Tanks**
- **API 650 Ed. 11 (2007), Welded Tanks for Oil Storage**
- **I.S. EN 14015:2004, Specification for the design and manufacture of site built, vertical, cylindrical, flat-bottomed, above ground, welded, steel tanks for the storage of liquids at ambient temperature and above**

Steel tanks should be welded by following the procedures described in the **AS/NZS 1554, Structural steel welding Series**. More specifically, the most common Standard used for welding is **AS/NZS 1554.1:2004, Structural steel welding – Welding of steel structures**.

### Underground Storage Tanks

Standards Australia has not established any Standards for underground storage tanks. However, underground storage tanks are commonly manufactured from glass fibre reinforced (GRP) and steel and the European and UL Standards covering manufacturing requirements for GRP and steel underground storage tanks is included below:

- **I.S. EN 976-1:1998, Underground Tanks Of Glass-reinforced Plastics (grp) - Horizontal Cylindrical Tanks For The Non-pressure Storage Of Liquid Petroleum Based Fuels - Requirements And Test Methods For Single Wall Tanks**
- **I.S. EN 12285-1:2003, Workshop Fabricated Steel Tanks - Part 1: Horizontal Cylindrical Single Skin And Double Skin Tanks For The Underground Storage Of Flammable And Non-flammable Water Polluting Liquids**
- **I.S. EN 12542:2010, Lpg Equipment and Accessories - Static Welded Steel Cylindrical Tanks, Serially Produced for the Storage of Liquefied Petroleum gas (lpg) Having a Volume not Greater Than 13 M<sup>3</sup> - Design and Manufacture**
- **UL 58 Ed. 9 (1996), Steel Underground Tanks for Flammable and Combustible Liquids**
- **UL 1316 Ed.2 (1994), Glass Fibre Reinforced Plastic Underground Storage Tanks For Petroleum Products, Alcohols, And Alcohol Gasoline Mixtures**

### Road Tankers

Road tankers used to transport dangerous goods should be manufactured to the **AS 2809, Road tank vehicles for dangerous goods Series**.

### Small Containers (Jerry cans) Used To Store Fuel

Portable plastic and metal containers used to store up to 25 L of fuel should be designed and manufactured to the requirements specified in **AS/NZS 2906:2001, Fuel containers – Portable-plastic and metal.**

## Miscellaneous Dangerous Goods

The storage and handling Standard for Class 9 dangerous goods is **AS/NZS 4681:2000, The storage and handling of Class 9 (miscellaneous) dangerous goods and articles.**

## SAI Global Product Certification Schemes

SAI Global Limited is the largest provider of third party product certification services in Asia Pacific, and is accredited against a broad range of Australian and International Standards, via its wholly owned subsidiary SAI Global Certification Services Pty Limited.

The [Product Certification Services](#) Group offers a wide range of certification schemes tailored for dangerous goods.

### StandardsMark

StandardsMark™ is a [System 5 certification scheme](#) which is used to certify manufacturers of electrical equipment to specific product performance Standards. The '5 ticks' StandardsMark™ certification requirements are:

- Testing of sample products by independent accredited laboratories
- Verification of test reports
- Audit of the manufacturing site for initial and ongoing compliance

### CE Programs

CE Program for Pressure Equipment Directive (PED) 97/23/EC is offered to those selling their pressure equipment products in the European Union. The SAI Global certification scope includes European certification of materials, and jointing (welding) approvals, for example fire extinguishers.

CE Program for Simple Pressure Vessel Directive (SPD) 87/404/EEC is offered to those selling their simple pressure vessel products in the European Union. The SAI Global certification scope covers all simple pressure vessel products.

### Gas Cylinder Test Station

Gas Cylinder Test Station certification specifies the requirements for the certification of gas cylinder test stations as specified in the **AS 2337, Gas cylinder test stations Series**. SAI Global certifies test stations to test cylinders of various categories. Some examples of these categories are:

- welded and brazed (BBQ, camping and other types of LPG cylinders other than automotive)
- seamless (SCUBA, CO2 fire extinguishers)
- composite (previously known as fibre reinforced plastic and breathing apparatus)
- automotive LPG (LPG fuel vessels for cars)
- automotive CNG (natural gas fuel cylinders for trucks and buses).



Please contact the [Product Certification Services](#) Group if you require any further information on the above schemes.

Phone: +61 2 8206 6322

Email: [product@saiglobal.com](mailto:product@saiglobal.com)

## Online Resources

For a list of online resources used to locate legislation, Government Departments, Law Foundations and Institutes.

Do you need online access to the Building Code of Australia and all the Australian Standards® referenced within it? - [www.saiglobal.com/BCA](http://www.saiglobal.com/BCA)

Do you need guidance on which Australian Standards® or parts thereof are referred to in legislation? - [www.saiglobal.com/Newsletters](http://www.saiglobal.com/Newsletters)

Would you like to be notified when Standards relevant to you are updated, amended or newly released? - [www.saiglobal.com/SW](http://www.saiglobal.com/SW)

Do you need online access to the full text of your own customised selection of Australian Standards® as well as optional access to international Standards? - [www.saiglobal.com/Select](http://www.saiglobal.com/Select)

Do you need to stay current on Australian Legislative, Regulatory and Compliance News? - [www.saiglobal.com/compliance/regulatory-news/asiapac](http://www.saiglobal.com/compliance/regulatory-news/asiapac)

Would you like to drive continued organizational success with results-focused training and professional development? - [www.saiglobal.com/training](http://www.saiglobal.com/training)

## Regulators

Contact details for Australian Government, State and Territory dangerous goods regulators is included in Volume 1 of [Australian Dangerous Goods Code \(ADG Code\)](#).

### LP Conversion Regulators

A list of regulators and responsible for enforcing regulations and codes of practice for personnel responsible for converting LP gas to vehicles is included in **AS/NZS 1425:2007, LP Gas fuel systems for vehicle engines**.

### Chemical Safety Regulators

Australian Government

Australian Pesticides and Veterinary Medicines Authority (APVMA)

Website: [www.apvma.gov.au](http://www.apvma.gov.au)

Email: [contact@apvma.gov.au](mailto:contact@apvma.gov.au)

Australian Government

Australian Government Department of Health and Ageing

National Industrial Chemicals Notification and Assessment Scheme - NICNAS

Website: [www.nicnas.gov.au](http://www.nicnas.gov.au)

Email: [info@nicnas.gov.au](mailto:info@nicnas.gov.au)

Safe Work Australia

Website: [www.safeworkaustralia.gov.au](http://www.safeworkaustralia.gov.au)

Email: [info@safeworkaustralia.gov.au](mailto:info@safeworkaustralia.gov.au)

### Gas Regulators

NSW Department of Fair Trading

Website: [www.dft.nsw.gov.au/Consumers/Product\\_and\\_service\\_safety/Gas\\_safety.html](http://www.dft.nsw.gov.au/Consumers/Product_and_service_safety/Gas_safety.html)

Energysafe Victoria

Website: [www.esv.vic.gov.au/ForGasProfessionals/tabid/55/Default.aspx](http://www.esv.vic.gov.au/ForGasProfessionals/tabid/55/Default.aspx)

Government of Western Australia

Department of Mines and Petroleum

Website: [www.dmp.wa.gov.au](http://www.dmp.wa.gov.au)

Email: [psb@dmp.wa.gov.au](mailto:psb@dmp.wa.gov.au)

Government of Western Australia

Department of Commerce

Website: [www.commerce.wa.gov.au/EnergySafety/](http://www.commerce.wa.gov.au/EnergySafety/)

Email: [energysafety@commerce.wa.gov.au](mailto:energysafety@commerce.wa.gov.au)

**Queensland Government**

Department of Employment, Economic Development and Innovation  
Mines and Energy

Website: [www.dme.qld.gov.au/mines/petroleum\\_gas\\_safety.cfm](http://www.dme.qld.gov.au/mines/petroleum_gas_safety.cfm)

Email: [gassafe@dme.qld.gov.au](mailto:gassafe@dme.qld.gov.au)

**Government of South Australia**

Department of Transport, Energy and Infrastructure  
Office of the Technical Regulator

Website: [technicalregulator.sa.gov.au/office\\_of\\_the\\_technical\\_regulator/gas](http://technicalregulator.sa.gov.au/office_of_the_technical_regulator/gas)

Email: [dtei.enquiriesadministrator@sa.gov.au](mailto:dtei.enquiriesadministrator@sa.gov.au)

**Department of Justice**

Workplace Standards Tasmania

Website: [www.wst.tas.gov.au/industries/gas](http://www.wst.tas.gov.au/industries/gas)

Email: [wstinfo@justice.tas.gov.au](mailto:wstinfo@justice.tas.gov.au)

**ACT Government**

ACT Planning and Land Authority (ACTPLA)

Website: [www.actpla.act.gov.au](http://www.actpla.act.gov.au)

Email: [gasadmin@act.gov.au](mailto:gasadmin@act.gov.au)

**Northern Territory Government**

Department of Resources – Minerals and Energy

Website: [www.nt.gov.au/d/Minerals\\_Energy/](http://www.nt.gov.au/d/Minerals_Energy/)

## Customer Service Contacts

**Information Services Division**

Standards & Technical Information Group

Within Australia: 131 242 (Press 1)

Outside Australia: +61 2 8206 6010 (Press 1)

Email: [sales@saiglobal.com](mailto:sales@saiglobal.com)

[StandardsWatch: be alerted when Standards change](#)

**Assurance Services Division**

Product Certification Services Group

Within Australia: 1300 360 314

Outside Australia: +61 2 8206 6322

Email: [product@saiglobal.com](mailto:product@saiglobal.com)

[Product Certification Key Documents](#)