

AS 3833:2024



STANDARDS  
Australia



# The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers



AS 3833:2024

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CSIRO  
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# **The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers**

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## Preface

This document was prepared by Australian members of Joint Standards Australia/Standards New Zealand Committee CH-009, Safe Handling of Chemicals, to supersede AS/NZS 3833:2007.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian rather than an Australian/New Zealand Standard.

The objective of this document is to provide minimum acceptable safety requirements for premises where more than one class of dangerous goods is stored and handled, whether in packages or intermediate bulk containers (IBCs) of up to 1.6 m<sup>3</sup> capacity.

This document addresses the storage and handling of mixed classes of dangerous goods of Classes and Divisions 1.4S (as consumer commodities), 2 (as consumer commodities or aerosols of UN 1950), 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8 and 9, and combustible liquids when stored with the dangerous goods, in packages and IBCs as described above.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this document. Notes that appear in the main text are intended to provide information and recommendations only.

# Contents

|                                                                                                                                                                   |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Preface</b>                                                                                                                                                    | <b>ii</b>  |
| <b>Introduction</b>                                                                                                                                               | <b>vii</b> |
| <b>Section 1 Scope and general</b>                                                                                                                                | <b>1</b>   |
| 1.1 Scope                                                                                                                                                         | 1          |
| 1.2 Application                                                                                                                                                   | 1          |
| 1.2.1 Which Standard should be used?                                                                                                                              | 1          |
| 1.2.2 Where this document applies                                                                                                                                 | 2          |
| 1.2.3 Where this document does not apply                                                                                                                          | 3          |
| 1.3 Normative references                                                                                                                                          | 3          |
| 1.4 Terms and definitions                                                                                                                                         | 5          |
| <b>Section 2 Minor storage</b>                                                                                                                                    | <b>16</b>  |
| 2.1 Scope of section                                                                                                                                              | 16         |
| 2.2 Criteria for classification as minor storage                                                                                                                  | 16         |
| 2.3 Precautions applying to minor storage                                                                                                                         | 16         |
| 2.4 Additional precautions for outdoor minor storage                                                                                                              | 17         |
| <b>Section 3 Retail storage</b>                                                                                                                                   | <b>18</b>  |
| 3.1 Scope of section                                                                                                                                              | 18         |
| 3.2 Application of section                                                                                                                                        | 18         |
| 3.3 Retail packages                                                                                                                                               | 18         |
| 3.4 General requirements for retail storage                                                                                                                       | 20         |
| 3.4.1 Design and construction of retail stores                                                                                                                    | 20         |
| 3.4.2 Ventilation                                                                                                                                                 | 20         |
| 3.4.3 Security and access                                                                                                                                         | 21         |
| 3.4.4 Housekeeping                                                                                                                                                | 22         |
| 3.4.5 Segregation of retail packages                                                                                                                              | 22         |
| 3.4.6 Tinting of flammable paints                                                                                                                                 | 22         |
| 3.4.7 Training                                                                                                                                                    | 22         |
| 3.4.8 Inspection of stock                                                                                                                                         | 22         |
| 3.4.9 Fire protection                                                                                                                                             | 23         |
| 3.4.10 Emergency procedures                                                                                                                                       | 23         |
| 3.5 Additional requirements for retail shops for pool chemicals                                                                                                   | 23         |
| 3.5.1 Quantities allowed                                                                                                                                          | 23         |
| 3.5.2 Segregation                                                                                                                                                 | 24         |
| 3.6 Additional requirements for retail shops selling agricultural chemicals                                                                                       | 24         |
| 3.7 Additional requirements for retail distribution centres storing dangerous goods only in retail packages, in quantities greater than <a href="#">Table 3.2</a> | 24         |
| 3.7.1 General                                                                                                                                                     | 24         |
| 3.7.2 Design and construction                                                                                                                                     | 25         |
| 3.7.3 Activities in retail distribution centres                                                                                                                   | 25         |
| 3.7.4 Control of ignition sources                                                                                                                                 | 25         |
| 3.7.5 Work permits                                                                                                                                                | 25         |
| 3.7.6 Impact protection                                                                                                                                           | 26         |
| 3.7.7 Training                                                                                                                                                    | 26         |
| 3.7.8 Storage of aerosols                                                                                                                                         | 26         |
| 3.7.9 Inspection of stock                                                                                                                                         | 27         |
| <b>Section 4 Transit storage</b>                                                                                                                                  | <b>28</b>  |
| 4.1 Scope of section                                                                                                                                              | 28         |
| 4.2 Delineation of transit storage areas                                                                                                                          | 28         |
| 4.3 Requirements for transit storage                                                                                                                              | 28         |
| 4.4 Separation and segregation                                                                                                                                    | 29         |
| <b>Section 5 Storage and handling of packages and intermediate bulk containers</b>                                                                                | <b>30</b>  |
| 5.1 Scope of section                                                                                                                                              | 30         |

|                  |                                                              |           |
|------------------|--------------------------------------------------------------|-----------|
| 5.2              | Application of section .....                                 | 30        |
| 5.3              | Planning.....                                                | 30        |
| 5.3.1            | General.....                                                 | 30        |
| 5.3.2            | Hazard identification and risk assessment.....               | 30        |
| 5.3.3            | Separation and Segregation.....                              | 31        |
| 5.4              | Design and construction of stores .....                      | 31        |
| 5.4.1            | General.....                                                 | 31        |
| 5.4.2            | Exits.....                                                   | 32        |
| 5.4.3            | Spillage containment.....                                    | 32        |
| 5.4.4            | Lighting.....                                                | 33        |
| 5.4.5            | Ventilation.....                                             | 33        |
| 5.5              | General requirements.....                                    | 35        |
| 5.6              | Security of storage areas.....                               | 36        |
| 5.7              | Storage of packages .....                                    | 36        |
| 5.8              | Storage of IBCs.....                                         | 36        |
| 5.8.1            | Stacking.....                                                | 37        |
| 5.9              | Storage in freight containers.....                           | 37        |
| 5.10             | Storage in cabinets.....                                     | 38        |
| 5.10.1           | Types of substances kept.....                                | 38        |
| 5.10.2           | Maximum quantities to be kept.....                           | 39        |
| 5.10.3           | Cabinet construction.....                                    | 39        |
| 5.10.4           | Cabinet location.....                                        | 39        |
| 5.10.5           | Exclusion of ignition sources.....                           | 40        |
| 5.10.6           | Cabinet marking.....                                         | 40        |
| 5.11             | Offices within stores.....                                   | 40        |
| <b>Section 6</b> | <b>Separation and segregation .....</b>                      | <b>41</b> |
| 6.1              | Scope of section.....                                        | 41        |
| 6.2              | Separation distances for stores.....                         | 41        |
| 6.2.1            | General.....                                                 | 41        |
| 6.2.2            | Separation to protected places on adjoining properties ..... | 41        |
| 6.2.3            | Separation to property boundary and ignition sources.....    | 41        |
| 6.2.4            | Separation to on-site protected places .....                 | 41        |
| 6.2.5            | Measurement of separation distances .....                    | 42        |
| 6.3              | Segregation within the store.....                            | 43        |
| 6.3.1            | General.....                                                 | 43        |
| 6.3.2            | Segregation of dangerous goods from foodstuffs .....         | 44        |
| 6.3.3            | Guidance on segregation distances.....                       | 44        |
| 6.3.4            | Additional segregation for flammable materials.....          | 46        |
| 6.3.5            | Storage of dangerous goods of Division 5.1.....              | 47        |
| 6.3.6            | Storage of non-dangerous goods in segregation spaces.....    | 47        |
| <b>Section 7</b> | <b>Operational and personnel safety .....</b>                | <b>48</b> |
| 7.1              | Scope of section.....                                        | 48        |
| 7.2              | General precautions .....                                    | 48        |
| 7.2.1            | Control of entry .....                                       | 48        |
| 7.2.2            | Clear access.....                                            | 48        |
| 7.2.3            | Lighting .....                                               | 48        |
| 7.2.4            | Ventilation.....                                             | 48        |
| 7.2.5            | Activities within stores.....                                | 48        |
| 7.2.6            | Handling precautions.....                                    | 49        |
| 7.2.7            | Process feedstocks and products.....                         | 49        |
| 7.2.8            | Sources of ignition and heat.....                            | 49        |
| 7.2.9            | Safety information .....                                     | 49        |
| 7.2.10           | Packagings for dangerous goods.....                          | 50        |
| 7.2.11           | Marking of packages.....                                     | 50        |
| 7.2.12           | Mechanical handling equipment in hazardous areas.....        | 50        |
| 7.3              | Operating procedures.....                                    | 50        |
| 7.3.1            | General requirements.....                                    | 50        |

|                  |                                                            |           |
|------------------|------------------------------------------------------------|-----------|
| 7.3.2            | Operating procedures.....                                  | 51        |
| 7.3.3            | Construction and maintenance procedures.....               | 51        |
| 7.3.4            | Emergency procedures.....                                  | 52        |
| 7.3.5            | Conformance with procedures.....                           | 52        |
| 7.4              | Placarding.....                                            | 52        |
| 7.4.1            | Placarding of stores.....                                  | 52        |
| 7.4.2            | Emergency information.....                                 | 52        |
| 7.5              | Housekeeping.....                                          | 52        |
| 7.5.1            | Site upkeep.....                                           | 52        |
| 7.5.2            | Housekeeping procedures.....                               | 53        |
| 7.6              | Effluent control.....                                      | 53        |
| 7.7              | Construction and maintenance work.....                     | 53        |
| 7.7.1            | General.....                                               | 53        |
| 7.7.2            | Routine work.....                                          | 53        |
| 7.7.3            | Work permit.....                                           | 53        |
| 7.7.4            | Preparation of work site.....                              | 54        |
| 7.7.5            | Completion of work and commissioning.....                  | 54        |
| 7.7.6            | Hot work.....                                              | 54        |
| 7.7.7            | Management of change.....                                  | 54        |
| 7.8              | Personnel training.....                                    | 55        |
| 7.8.1            | Training of workers.....                                   | 55        |
| 7.8.2            | Contractors.....                                           | 56        |
| 7.8.3            | Hygiene.....                                               | 56        |
| 7.9              | Personal protective equipment.....                         | 56        |
| 7.9.1            | General.....                                               | 56        |
| 7.9.2            | Types of personal protective equipment.....                | 56        |
| 7.9.3            | Care and maintenance of personal protective equipment..... | 57        |
| 7.10             | First aid.....                                             | 57        |
| <b>Section 8</b> | <b>Emergency management.....</b>                           | <b>58</b> |
| 8.1              | Scope of section.....                                      | 58        |
| 8.2              | Planning for emergencies.....                              | 58        |
| 8.2.1            | Considerations in designing premises.....                  | 58        |
| 8.2.2            | Emergency plan.....                                        | 58        |
| 8.3              | Emergency services requirements.....                       | 60        |
| 8.4              | Management of leaks and spills.....                        | 60        |
| 8.4.1            | General.....                                               | 60        |
| 8.4.2            | Clean-up materials and equipment.....                      | 60        |
| 8.4.3            | Actions for dealing with leaks and spills.....             | 60        |
| <b>Section 9</b> | <b>Fire protection.....</b>                                | <b>62</b> |
| 9.1              | Scope of section.....                                      | 62        |
| 9.2              | Fire hazards.....                                          | 62        |
| 9.3              | Fire protection measures.....                              | 62        |
| 9.3.1            | General.....                                               | 62        |
| 9.3.2            | Design.....                                                | 63        |
| 9.3.3            | System drawing illustrations.....                          | 63        |
| 9.3.4            | Equipment and piping identification.....                   | 63        |
| 9.3.5            | Impact protection.....                                     | 64        |
| 9.3.6            | Heat protection.....                                       | 64        |
| 9.3.7            | Compatibility.....                                         | 64        |
| 9.3.8            | Location.....                                              | 64        |
| 9.3.9            | Weather protection.....                                    | 64        |
| 9.3.10           | Labelling of firefighting equipment.....                   | 64        |
| 9.3.11           | Fixed fire protection and detection systems.....           | 65        |
| 9.3.12           | Fire alarm systems.....                                    | 65        |
| 9.4              | Portable fire extinguishers.....                           | 65        |
| 9.4.1            | General.....                                               | 65        |
| 9.4.2            | Special risks.....                                         | 66        |

|                   |                                                                                                                |           |
|-------------------|----------------------------------------------------------------------------------------------------------------|-----------|
| 9.4.3             | Maintenance.....                                                                                               | 66        |
| 9.4.4             | Limitations.....                                                                                               | 66        |
| 9.4.5             | Type and rating.....                                                                                           | 66        |
| 9.5               | Fire hose reels.....                                                                                           | 66        |
| 9.6               | Fire hydrants.....                                                                                             | 67        |
| 9.7               | Monitors.....                                                                                                  | 67        |
| 9.8               | Automatic sprinkler systems.....                                                                               | 68        |
| 9.9               | Water supply.....                                                                                              | 68        |
| 9.10              | Retention of fire water.....                                                                                   | 68        |
| 9.11              | Fire protection requirements.....                                                                              | 68        |
| <b>Section 10</b> | <b>Waste storage and disposal.....</b>                                                                         | <b>71</b> |
| 10.1              | Scope of section.....                                                                                          | 71        |
| 10.2              | Storage of wastes.....                                                                                         | 71        |
| 10.3              | Waste and inventory management.....                                                                            | 71        |
| 10.4              | Methods of disposal.....                                                                                       | 71        |
| <b>Appendix A</b> | <b>(informative) Classes of dangerous goods.....</b>                                                           | <b>72</b> |
| <b>Appendix B</b> | <b>(informative) Issues to be considered in a risk assessment.....</b>                                         | <b>75</b> |
| <b>Appendix C</b> | <b>(informative) Example risk assessment for separation and segregation risk assessment examples.....</b>      | <b>78</b> |
| <b>Appendix D</b> | <b>(informative) Emergency services information requirements.....</b>                                          | <b>83</b> |
| <b>Appendix E</b> | <b>(informative) Placarding, marking, labelling and signage for storage and handling.....</b>                  | <b>85</b> |
| <b>Appendix F</b> | <b>(informative) Bibliography of documents providing guidelines on the preparation of emergency plans.....</b> | <b>87</b> |
| <b>Appendix G</b> | <b>(informative) Stacking and handling different types of IBCs.....</b>                                        | <b>88</b> |

## Introduction

This document provides requirements and recommendations for the storage and handling of more than one class of dangerous goods within the same storage area, without the need for segregating walls. It may be applied where the dangerous goods are kept in packages and intermediate bulk containers (IBCs) of up to 1.6 m<sup>3</sup> capacity.

This document is different from many of the other Australian or Joint Standards for the storage and handling of dangerous goods, in that it allows more than one class of dangerous goods to be stored together, without the need for segregating walls between the different classes. To achieve this storage, certain assumptions have been made and requirements added. These are outlined below, with further information given in the body of the document.

This document prohibits certain types and classes of dangerous goods from the mixed class store because of their special requirements, their hazards, or the additional risk they could present. These dangerous goods are excluded from this document. The dangerous goods that may be included in the mixed class store, and those that are excluded, are described in [Section 1](#).

Where it is necessary to store any of the dangerous goods that are excluded from this document, the relevant Australian or Joint Standard for those dangerous goods needs to be used.

A documented risk assessment should be undertaken to ensure that all dangerous goods being stored or handled at the workplace are known, the associated risks are identified and appropriate controls are implemented.

The risk assessment should identify the compatibility or otherwise of all of the dangerous goods that are to be stored. Some goods might react dangerously, and this also needs to be identified. If goods that are not dangerous goods are to be kept in the same store, their compatibility may also need to be investigated. This information is necessary so that the goods can be suitably segregated within the store.

The risk assessment should also provide for ongoing store management and housekeeping.

It may be necessary to obtain expert advice when planning the store. It is usually best to contact the relevant regulatory authority for the storage and handling of dangerous goods at an early stage.

Any incompatible goods, and goods which might react dangerously, will need to be segregated within the store. Segregation is described in [Section 6](#). It may also be necessary to segregate dangerous goods from any foodstuffs or food ingredients in the store.

Many dangerous goods are packed in small packages for retail sale. Requirements for such dangerous goods in retail shops and retail distribution centres is given in [Section 3](#) of this document.

The standard of management and housekeeping in the store needs to be consistently high. This is to ensure safe storage and effective management of any emergencies that could arise. It is important that the segregation of goods is maintained at all times.

## NOTES

# Australian Standard®

## The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers

### Section 1 Scope and general

#### 1.1 Scope

This document sets out requirements and recommendations for the safe storage and handling of dangerous goods, in packages of up to 500 kg/l and intermediate bulk containers (IBCs) of up to 1.6 m<sup>3</sup> capacity, where dangerous goods of more than one class are kept within the same store, without the need for segregating walls.

The objective of this document is to provide minimum acceptable safety requirements for storage areas, operating procedures, emergency planning and fire protection. It provides technical guidance that may assist in the storage and handling of dangerous goods in accordance with regulatory requirements.

Where a dangerous goods is assigned to more than one hazard Class, the requirements in this document apply for all assigned classes.

NOTE 1 Dangerous goods are classified as such and listed in the *UN Recommendations on the Transport of Dangerous Goods — Model Regulations*. They are also listed in the *Australian Dangerous Goods Code* (ADG Code).

NOTE 2 An outline of the classes and divisions of dangerous goods is provided in [Appendix A](#).

NOTE 3 SafeWork Australia Model Code of Practice “How to manage work health and safety risks” should also be consulted regarding risk management.

#### 1.2 Application

##### 1.2.1 Which Standard should be used?

AS 3833 provides guidance about the safe storage and handling of dangerous goods when multiple classes are present. It is intended for environments such as retail or distribution facilities, vehicle loading and unloading areas, and some manufacturing sites. As a result, it may be necessary to consider several Standards:

- (a) The relevant Australian or Joint Standard for each class of dangerous goods being stored, e.g. AS 5026 for Class 4 dangerous goods.
- (b) Any industry-specific Australian or Joint Standard for the storage and handling of the dangerous goods being stored, e.g. AS 2507.
- (c) Any Australian or Joint Standard for a specific type of dangerous goods, e.g. AS/NZS 4081.
- (d) This document.

The most relevant Standard(s) shall be applied in consideration of all the circumstances. Elements of multiple Standards may be applied where it is necessary to access the most relevant guidance or address a specific hazard.

Selection of the most appropriate Standard shall be made with regard to the following principles:

- (i) The nature of the facility and its operations. AS 3833 is particularly suited to environments such as retail or distribution facilities where many different classes are present in the same area and are handled together due to the nature of the business.

- (ii) The degree of physical proximity of different classes within the same store. AS 3833 is not suitable where multiple classes are present at the facility but they are kept in separate stores or significantly segregated areas.
- (iii) The variety and proportions of different classes of dangerous goods present at the facility. It is preferable to apply a class-specific Standard where that class predominates within the store. AS 3833 is suitable for storage and handling areas where interaction of classes may occur. AS 3833 should not automatically be selected only because more than one class is present.
- (iv) The properties and hazards associated with the classes of dangerous goods present at the facility. AS 3833 does not cater to the unique properties of all types of dangerous goods, and it may be necessary to consult class- or product-specific Standards to control specific hazards identified in the risk assessment required by AS 3833.
- (v) Where no class- or product-specific Standard exists, such as for storage and handling of aerosols smaller than 1 litre, relevant guidance in AS 3833 may be consulted. This is acceptable even when only a single class is present in the store.

### 1.2.2 Where this document applies

This document applies to the storage and handling of dangerous goods, in packages and IBCs, where more than one class of dangerous goods is kept in the one store, i.e. in “mixed class” storage. It applies to the following Classes and Divisions of dangerous goods:

- (a) Dangerous goods of Classes 3, 8 and 9, and Divisions 4.1, 5.1 and 6.1.
- (b) Dangerous goods of Packing Group I where they are compatible with the other goods being stored.
- (c) Retail explosives of Class 1 are as follows:
  - (i) Toy fireworks of Division 1.4S including bonbons, amorces, starting pistol caps, and party poppers.
  - (ii) Cartridges for explosive-powered tools of Division 1.4S.
  - (iii) Sparklers of Division 1.4G.

NOTE 1 Explosives are subject to Commonwealth, State or Territory legislation governing explosives, firearms, or other substances. Such legislation may prohibit certain articles, limit quantities, or require a licence.

NOTE 2 Other explosives such as small arms ammunition, distress signals and model rocket motors are not within scope of this document.
- (d) Gases of Divisions 2.1 and 2.2 in aerosols or retail packages (e.g. non-refillable gas cartridges of camping gas).
- (e) Dangerous goods of Division 4.2 where the goods are PG III only.
- (f) Dangerous goods of Division 4.3 where they are kept in a cabinet.
- (g) Organic peroxides of Division 5.2 in retail packages and, other than in retail packages, only organic peroxides of Division 5.2 that are listed in Appendix 7 of the ADG Code as not requiring temperature control.

NOTE 3 Isolated storage areas or cabinets, as described in AS 2714, would normally be used.
- (h) Class 7 (radioactive) dangerous goods in smoke detectors.

This document also applies to the storage and handling of any combustible liquids, in packages and IBCs, that are stored with the dangerous goods described above.

NOTE 4 There may not be any legal requirements to label combustible liquids as such, so it may be difficult to ascertain whether a liquid is a C1 or C2 combustible liquid. The actual classification may be determined from the liquid's flash point, which is usually found on the Safety Data Sheet (SDS) for the liquid. Where the flash point is not given on the SDS, it should be ascertained from the manufacturer or Australian supplier of the liquid.

This document applies in locations that are generally industrial, commercial or rural in nature. It also applies to transit storage of dangerous goods.

NOTE 5 Where dangerous goods of Division 1.4S are kept, the relevant explosives regulations need to be consulted.

NOTE 6 A premises may come under the regulatory control of several authorities having different areas of responsibility, and agreement from one may not necessarily constitute agreement from others.

### 1.2.3 Where this document does not apply

#### 1.2.3.1 Locations and situations

This document does not apply to the following locations and situations:

- (a) Port areas.
- (b) Transport outside the premises by road and rail.
- (c) Storage of any dangerous goods which are not in packages or IBCs.
- (d) Laboratories, as defined in AS 2243.2.

#### 1.2.3.2 Types of dangerous goods

This document does not apply to the following types of dangerous goods:

- (a) Explosives, other than those described in [Clause 1.2.2\(c\)](#).
- (b) Gases in cylinders, in which case AS 4332 should be consulted.
- (c) Dangerous goods of Division 4.2, PG I and II.
- (d) Organic peroxides of Division 5.2 that are listed in the ADG Code as requiring temperature control. AS 2714 applies to the storage of dangerous goods of Division 5.2.
- (e) Any goods of Division 6.2 (infectious substances).
- (f) Class 7 (radioactive) dangerous goods, unless fitted in smoke detectors.

### 1.3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1319, *Safety signs for the occupational environment*

AS 1530.1, *Methods for fire tests on building materials, components and structures, Part 1: Combustibility test for materials*

AS 1530.4, *Methods for fire tests on building materials, components and structures, Part 4: Fire-resistance test for elements of construction*

AS 1580.301.1, *Paints and related materials — Methods of test, Method 301.1: Non-volatile content by mass*

AS 1670 (all parts), *Fire detection, warning, control and intercom systems — System design, installation and commissioning*

AS 1674 (all parts), *Safety in welding and allied processes*

AS 1851, *Routine service of fire protection systems and equipment*

AS 1940, *The storage and handling of flammable and combustible liquids*

AS 2106 (all parts), *Methods for the determination of the flash point of flammable liquids (closed cup)*

AS 2118 (all parts), *Automatic fire sprinkler systems*

AS 2187.1, *Explosives — Storage, transport and use, Part 1: Storage*

AS 2359.12, *Powered industrial trucks, Part 12: Hazardous areas*

AS 2419 (all parts), *Fire hydrant installations*

AS 2441, *Installation of fire hose reels*

AS 2444, *Portable fire extinguishers and fire blankets — Selection and location*

AS 2507, *The storage and handling of agricultural and veterinary chemicals*

AS 2941, *Fixed fire protection systems — Pumpset systems*

AS 3780, *The storage and handling of corrosive substances*

AS 4214, *Gaseous fire extinguishing systems*

AS 4265, *Wheeled fire extinguishers*

AS 4326, *The storage and handling of oxidizing agents*

AS 4332, *The storage and handling of gases in cylinders*

AS 4775, *Emergency eyewash and shower equipment*

AS 60529, *Degrees of protection provided by enclosures (IP Code)*

AS/NZS 1221, *Fire hose reels*

AS/NZS 1337.1, *Personal eye protection, Part 1: Eye and face protectors for occupational applications*

AS/NZS 1596, *The storage and handling of LP Gas*

AS/NZS 1680.2.4, *Interior lighting, Part 2.4: Industrial tasks and processes*

AS/NZS 1715, *Selection, use and maintenance of respiratory protective equipment*

AS/NZS 1716, *Respiratory protective devices*

AS/NZS 1800, *Occupational protective helmets — Selection, care and use*

AS/NZS 1801, *Occupational protective helmets*

AS/NZS 1841 (all parts), *Portable fire extinguishers*

AS/NZS 1850, *Portable fire extinguishers — Classification, rating and performance testing*

AS/NZS 2161 (all parts), *Occupational protective gloves*

AS/NZS 2210.1, *Safety, protective and occupational footwear, Part 1: Guide to selection, care and use*

AS/NZS 3000, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*

AS/NZS 3711.4, *Freight containers, Part 4: General purpose containers (ISO 1496-1:2013, MOD)*

AS/NZS 4081, *The storage, handling and transport of liquid and liquefied polyfunctional isocyanates*

AS/NZS 4360, *Risk management*

AS/NZS 4452, *The storage and handling of toxic substances*

AS/NZS 4501.2, *Occupational protective clothing, Part 2: General requirements*

AS/NZS 60079.10.1, *Explosive atmospheres, Part 10.1: Classification of areas — Explosive gas atmospheres*

AS/NZS 60079.14, *Explosive atmospheres, Part 14: Design selection, erection and initial inspection*

AS ISO 7240-11, *Fire detection and alarms systems, Part 11: Manual Call Points*

ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*

ISO 2592, *Petroleum and related products — Determination of flash and fire points — Cleveland open cup method*

NFPA 11, *Standard for Low-, Medium- and High-Expansion Foam Systems*

NFPA 17, *Standard for Dry Chemical Extinguishing Systems*

UNECE. *Manual of Tests and Criteria*

National Transport Commission (Australia). ADG Code, Australian Code for the Transport of Dangerous Goods by Road and Rail

Australian Building Codes Board. NCC, National Construction Code

AHMAC (Australian Health Ministers' Advisory Council).

SUSMP. Standard for the Uniform Scheduling of Medicines and Poisons

Safe Work Australia, Managing risks of hazardous chemicals in the workplace — Code of Practice (June 2023)

Safe Work Australia, Preparation of safety data sheets for hazardous chemicals — Code of Practice (June 2023)

Safe Work Australia, Labelling of workplace hazardous chemicals — Code of Practice (June 2023)

UNECE. Recommendations on the transport of dangerous goods — Model regulations

## 1.4 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

### 1.4.1

#### ADG Code

Australian Code for the Transport of Dangerous Goods by Road & Rail, also known as the Australian Dangerous Goods Code, published by the National Transport Commission

**1.4.2****aerosol****aerosol dispenser**

non-refillable receptacle made of metal, glass, or plastics, containing a gas, compressed, liquefied or dissolved under pressure, with or without a liquid, paste or powder and fitted with a release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste or powder or in a liquid state or in a gaseous state

**1.4.3****agricultural chemical**

substance or mixture of substances used to control pests and plants in agriculture

Note 1 to entry: Agricultural chemicals are used as a means of directly or indirectly —

- (a) destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation or attacks of, any pest in relation to a plant, a place or a thing;
- (b) destroying a plant;
- (c) modifying the physiology of a plant or pest so as to alter its natural development, productivity, quality or reproductive capacity;
- (d) modifying the effect of another agricultural chemical; or
- (e) attracting a pest for the purpose of destroying it.

**1.4.4****NCC**

National Construction Code, Australia

**1.4.5****boundary**

perimeter of the whole of the site under the same occupancy as the storage area

**1.4.6****bund**

impervious embankment of earth, or a wall of brick, stone, concrete of other suitable material, which forms part or all of the perimeter of a compound

**1.4.7****capacity**

internal volume of the container at a temperature of 15°C, expressed in litres or cubic metres

**1.4.8****gas cartridge**

non-refillable packaging that —

- (a) is designed to hold its contents under pressure; and
- (b) needs to be punctured for removal of its contents.

**1.4.9****class (of dangerous goods)**

one of the nine hazard classes as defined in the ADG code

Note 1 to entry: A single substance may have more than one hazard Class, e.g. a primary hazard and one or more subsidiary hazards.

**1.4.10****combustible dust**

finely divided solid particles, 0.5 mm or less in nominal size, which may form an explosive mixture with air at atmospheric pressure and normal temperatures

Note 1 to entry: This includes dust and grit and does not preclude hollow particles.

Note 2 to entry: Fine particles of organic material (e.g. wood, flour, sugar, many fungicides) and of metals (e.g. aluminium) meet the classification of combustible dust.

**1.4.11****combustible liquid**

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

Note 1 to entry: For the purpose of this document, combustible liquids are divided into two as follows:

- (a) C1 — a combustible liquid having a flash point of more than 60 °C and no more than 93 °C
- (b) C2 — a combustible that—
  - (i) has a flash point of greater 93 °C; or
  - (ii) has been excluded from being a flammable liquid by any of the criteria for sustaining combustion. C1 combustible liquids should be labelled with the hazard statement “combustible liquid” under the GHS. There is no legal requirement to label C2 combustible liquids as such, so it may be difficult to ascertain whether a liquid in a drum or other package is a C2 combustible liquid. Safety data sheets (SDS) rarely contain this information. The actual classification may be determined from the flash point (see [Clause 1.4.22](#)). If the flash point is not provided on the SDS, it should be obtained from the manufacturer or supplier of the liquid.

Note 2 to entry: A water miscible solution with a water content of more than 90 % by mass, which has been excluded from being a flammable liquid and which does not have a fire point less than its boiling point, is not a combustible liquid.

**1.4.12****combustible materials**

materials deemed to be combustible when tested in accordance with AS 1530.1, e.g., waste paper, hay, sawdust, woodchips

**1.4.13****compatible**

in relation to dangerous goods, other goods, receptacles or equipment, that —

- (a) are not incompatible (as defined in [Clause 1.4.27](#)); or
- (b) do not react dangerously (as defined in [Clause 1.4.48](#)).

**1.4.14****compound**

area bound by natural ground contours or by a bund and impervious to retain any fire water, spillage or leakage. This includes the floor of the compound

Note 1 to entry: A containment vessel, pit or tank may be used for this purpose.

**1.4.15****container**

anything in or by which a substance is, or has been wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function

**1.4.16****corrosive substances**

substances or mixtures which, by chemical action, will cause irreversible damage to the skin, or in the case of leakage, will materially damage, or even destroy, metals or other goods

Note 1 to entry: Such substances are listed as Class 8 corrosive substances in the ADG Code or meet the classification criteria specified in that Code for corrosive substances.

**1.4.17****dangerous goods**

substances and articles that —

- (a) satisfy the UN criteria for determining whether they are dangerous goods; or
- (b) are listed in the ADG Code; or
- (c) are determined to be dangerous goods by the competent authority.

Note 1 to entry: UN tests and criteria are given in the UN *Manual of Tests and Criteria* and the UN *Recommendations on the Transport of Dangerous Goods — Model Regulations*.

**1.4.18****desensitized explosives**

explosive substances that are dissolved or suspended in water or other liquids, wetted with water or alcohols, or diluted with other substances to form a homogeneous mixture to suppress their explosive properties

**1.4.19****environmentally sensitive area**

area sensitive to damage from dangerous goods, which includes —

- (a) a water catchment area;
- (b) a reservoir for drinking water;
- (c) a freshwater or marine environment; or
- (d) a national park or equivalent.

**1.4.20****fire resistance level****FRL**

grading period, in minutes, determined in accordance with AS 1530.4 for —

- (a) structural adequacy;
- (b) integrity; and
- (c) insulation

and expressed in that order (e.g. 60/60/30)

Note 1 to entry: A dash means that there is no requirement for that criterion. For example, 90/-/- means there is no requirement for an FRL for integrity and insulation, and -/-/- means there is no requirement for an FRL.

**1.4.21****flammable gas**

gas which meets the classification criteria as Division 2.1 flammable gas in the ADG Code

**1.4.22****flammable liquid**

liquid which meets the classification criteria as a Class 3 flammable liquid in the ADG Code or meets the criteria as a flammable liquid in AS 1940

Note 1 to entry: Examples of flammable liquids include paints, varnishes, lacquers, etc., but not including substances otherwise classified on account of their dangerous characteristics.

**1.4.23****flash point**

lowest temperature, corrected to a barometric temperature of 101.3 kPa, at which application of a test flame causes the vapour of the test portion to ignite under the specified conditions of test

**1.4.24****food**

substance either —

- (a) prepared or intended for human or animal consumption; or
- (b) intended to be an ingredient (except dangerous goods) of food.

**1.4.25****food packaging**

receptacle that contains or is intended to contain food, including the following:

- (a) Material designed or intended to be used in a receptacle that is designed or intended to contain food.
- (b) Plastics wrapping intended for the packaging of food.

**1.4.26****freight container**

article of transport equipment that —

- (a) is of a permanent character strong enough to be suitable for repeated use;
- (b) is specially designed to facilitate the transport of goods, by one or other modes of transport, without intermediate reloading;
- (c) is fitted with devices permitting its ready stowage and handling, particularly its transfer from one mode of transport to another;
- (d) is so designed as to be easy to fill and empty;
- (e) has an internal volume of not less than 1 m<sup>3</sup>, except for containers for the carriage of radioactive material.

Note 1 to entry: Small freight container means a freight container that has an internal volume of not more than 3 m<sup>3</sup>.

Note 2 to entry: Large freight container means—

- (a) a freight container that does not meet the definition of a small freight container; or
- (b) a container of a size that the area enclosed by the four outer bottom corners is either—
  - (i) at least 14 m<sup>2</sup>; or
  - (ii) at least 7 m<sup>2</sup> if fitted with top corner fittings.

**1.4.27****Globally Harmonized System  
GHS**

classification and labelling of chemicals, published by the United Nations as document ST/SG/AC.10/30/

**1.4.28****hazardous area**

area (three-dimensional space) in which an explosive atmosphere, due to flammable gas or flammable vapour, is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment

Note 1 to entry: The classification of hazardous areas is given in AS/NZS 60079.10.1.

**1.4.29****hazardous chemical**

substance, mixture or article that satisfies the criteria for any one or more hazard classes in the GHS

**1.4.30****hot work**

use or operation of anything that is likely to produce a source of ignition including the following:

- (a) Welding or flame cutting equipment.
- (b) Grinders, electric drills, or other non-flameproof electrical equipment.
- (c) Hot tapping equipment.
- (d) Spark ignition equipment.
- (e) Spark ignition engines or non-approved compression ignition engines.
- (f) Matches, naked lights, cigarettes, cigarette lighters, flames or sparks.
- (g) Hand tools that might create a spark.
- (h) Non-flameproof electrical cables, cords, switches, lights, connectors or fittings.
- (i) Any other thing that is likely to produce a source of ignition or be an ignition source.

**1.4.31****ignition source**

source of energy sufficient to ignite a flammable or explosive atmosphere

Note 1 to entry: Ignition sources include the following:

- (a) A lighted match, a cigarette lighter, a lighted cigarette or other form of lighted tobacco, a lighted furnace, an incinerator, and any other naked flame.
- (b) Electrical equipment that is not suitable for use in an area defined as a hazardous area in AS/NZS 60079.10.1.
- (c) Spark ignition engines or compression engines not specifically designed or deemed to be suitable for hazardous areas.
- (d) Lithium batteries in use or charging.

**1.4.32****incompatible**

dangerous goods that are —

- (a) likely to interact with other goods so as to increase the risk when mixed or otherwise brought into contact with the dangerous goods;
- (b) listed in the ADG Code or this Standard as being incompatible; or

- (c) declared by the regulatory authority as being incompatible.

In relation to materials for construction of the storage and handling facility, including packaging, transfer equipment, containers, items of equipment, spill containment or racking the material likely to interact with the dangerous goods such that it is weakened or damaged

Note 1 to entry: This definition should be read in conjunction with [Clause 1.4.48](#).

#### **1.4.33**

##### **intermediate bulk container**

##### **IBC**

rigid or flexible portable packaging for the transport of dangerous goods that —

- (a) has a capacity of —
  - (i) not more than 3.0 m<sup>3</sup> (3,000 l) for solids or liquids of Packing Groups II and III;
  - (ii) not more than 1.5 m<sup>3</sup> for solids of Packing Group I when packed in flexible, rigid plastics, composite, fibreboard, plastics or wooden IBCs; and
  - (iii) not more than 3.0 m<sup>3</sup> for solids of Packing Group I when packed in metal IBCs.
- (b) is designed for mechanical handling;
- (c) is resistant to the stresses produced in usual handling and transport, as determined by the tests in Chapter 6.5 of the ADG Code.

Note 1 to entry: The scope of this document is limited to IBCs with a capacity up to 1.6 m<sup>3</sup>.

#### **1.4.34**

##### **isolation**

physical separation of dangerous goods from a person, property or thing by either distance or a physical barrier

#### **1.4.35**

##### **label (for dangerous goods)**

class or division diamond used to communicate the hazard(s) of the dangerous goods

#### **1.4.36**

##### **label (for hazardous chemicals)**

GHS pictogram and other written information required to communicate the hazard

#### **1.4.37**

##### **lithium batteries**

batteries containing lithium ion or lithium metal

#### **1.4.38**

##### **manufactured product**

dangerous goods of Class 3 Packing Group II or III that meet the definition of manufactured product in the ADG Code

Note 1 to entry: The term includes most viscous solvent-based paints, lacquers and polishes.

#### **1.4.39**

##### **marking (for dangerous goods)**

information required to be displayed on receptacles and packagings containing dangerous goods, primarily consisting of the UN Number, proper shipping name, UN specification marks and other marks where relevant

Note 1 to entry: Examples of orientation arrows, lithium battery mark, limited quantities mark, excepted quantities mark, etc.

Note 2 to entry: Marking does not include class or division hazard labels (diamonds).

**1.4.40****may**

indicates the existence of an option

**1.4.41****minor storage**

the storage of dangerous goods of mixed classes, in one or more locations, in quantities conforming to the criteria set out in [Section 2](#) of this document

**1.4.42****non-combustible**

material that does not support combustion or is deemed to be non-combustible when tested in accordance with AS 1530.1

**1.4.43****on-site protected place**

building where people are employed within the property boundary of the premises, including warehouses, manufacturing or processing areas, amenities or other dangerous goods stores where quantities exceed minor storage

**1.4.44****organic peroxides**

meets the classification criteria as a Division 5.2 Organic Peroxide in the ADG Code

**1.4.45****oxidizing substances**

meets the classification criteria as a Division 5.1 Oxidising Substance in the ADG Code

**1.4.46****package**

complete product of the packaging operation, consisting of the packaging and its contents, prepared for transport

**1.4.47****packaging**

container and any other components or materials necessary for the container to perform its function

**1.4.48****packing group**

**PG**  
category assigned to substances other than those of Classes 1, 2 and 7, Divisions 5.2 and 6.2, and other than self-reactive substances of Division 4.1 in accordance with the hazard they present

Note 1 to entry: The packing group to which a substance is assigned is indicated in the Dangerous Goods List in Chapter 3.2 of the ADG Code—

- (a) Packing Group I — Substances presenting high danger;
- (b) Packing Group II — Substances presenting medium danger; and
- (c) Packing Group III — Substances presenting low danger.

Note 2 to entry: Articles are not assigned to packing groups.

Note 3 to entry: The ADG Code provides criteria for the assignment of Packing Groups. A list of those already assigned, and criteria for assigning packing groups, are also given in the ADG Code.

**1.4.49****polymerizable material**

liquid, solid, or gaseous material that might polymerize (combine or react with itself) so as to expand or cause dangerous evolution of gas or heat

**1.4.50****port area**

land and sea area established by legislation and controlled by the relevant port authority

Note 1 to entry: Some port areas may overlap and legal requirements should take account of this possibility.

**1.4.51****premises**

area under the control of the occupier

**1.4.52****protected place**

any of the following:

- (a) A dwelling, residential building, place of worship, public building, school or college, hospital, theatre, and any building or open area in which persons are accustomed to assemble, whether it is within or outside the premises.
- (b) A factory, workshop, office, store, warehouse, shop, or building where persons are employed, that is outside the premises.
- (c) A ship lying at permanent berthing facilities.
- (d) Any storage facility for dangerous goods, other than minor storage, outside the premises.
- (e) An environmentally sensitive area.

**1.4.53****public place**

place, other than private property, open to the public, which the public has a right to use and which includes a public road

Note 1 to entry: Commercial building car parking areas are not considered to be public places.

Note 2 to entry: In New Zealand, a “public road” is a “road”.

**1.4.54****react dangerously**

react in a manner that directly creates a hazard due to the reaction

Note 1 to entry: Examples of dangerous reactions are —

- (a) combustion and/or evolution of considerable heat;
- (b) evolution of flammable, toxic or asphyxiant gases;
- (c) the formation of corrosive substances; or
- (d) the formation of unstable substances.

Note 2 to entry: Examples of substances that react dangerously are —

- (i) calcium hypochlorite (pool chlorine) and oil or petrol;
- (ii) sodium hypochlorite or calcium hypochlorite and acids; and
- (iii) hydrogen peroxide and organic substances.

Note 3 to entry: This definition should be read in conjunction with [Clause 1.4.25](#).

**1.4.55****regulatory authority**

authority responsible for administration of control of the storage, transport and use of dangerous goods

Note 1 to entry: More than one authority may be involved in relation to such matters.

**1.4.56****restricted area**

area to which access is available only to persons authorized by the occupier. For the purposes of this document, a dangerous goods store is regarded as a restricted area

**1.4.57****retail distribution centre**

warehouse or storage area used for the making up of deliveries to retail outlets, where goods are stored. Goods within a retail distribution centre are normally contained within outer packagings. Public access to such a centre is restricted

**1.4.58****retail shop**

either of the following:

- (a) An area at premises where goods are displayed for sale to the general public or end user.
- (b) An area behind a sales counter where goods are kept for the purpose of selling them to the general public or end user.

Includes an area where goods are received at the premises and stored prior to being displayed for sale or placed on the shelves

**1.4.59****retail package**

package containing goods for individual sale, predominantly through retail shops

Note 1 to entry: The term “retail package” includes pre-packed articles and consumer commodities.

**1.4.60****safety data sheet****SDS**

document which provides information on the identification, health hazards, precautions for use and safe handling of a specific chemical product, and which conforms with Safe Work Australia's *Model Code of Practice — Preparation of safety data sheets for hazardous chemicals*

Note 1 to entry: Safety data sheets were previously referred to as material safety data sheets MSDS.

**1.4.61****screen wall**

structurally sound wall that —

- (a) is impervious to liquid and vapour;
- (b) is constructed of materials that are substantially resistant to attack by the dangerous goods being stored; and
- (c) may act as a shield or deflection barrier.

**1.4.62****segregated**

isolated from each other within the store

**1.4.63****segregation**

isolation of incompatible goods from each other within the store

**1.4.64****separated**

isolated from the storage by a given minimum distance, which may be measured around a barrier

**1.4.65****separation**

isolation of dangerous goods from protected places, on-site protected places, boundaries and other dangerous goods stores

**1.4.66****shall**

indicates that a statement is mandatory

**1.4.67****should**

indicates a recommendation

**1.4.68****subsidiary hazard**

additional hazard(s) that the dangerous goods have, indicated by the Subsidiary hazard number(s) to which the dangerous goods are assigned in the dangerous goods list in the ADG Code. Dangerous goods are assigned a Subsidiary hazard if they —

- (a) satisfy the criteria specified in Chapter 2 of the ADG Code; or
- (b) are assigned a Subsidiary hazard by a regulatory authority.

**1.4.69****supplier**

importer, manufacturer, wholesaler or distributor, but not a retail distribution centre or retail outlet

**1.4.70****thermal runaway**

situation which arises when an exothermic reaction heats up the reacting materials, increasing the rate of reaction, which then increases the rate of heat production in a continuous cycle, leading to uncontrolled temperature rise and potential fire or explosion unless the reactants are consumed first

**1.4.71****toxic substances**

meets the classification criteria as a Division 6.1 Toxic Substance in the ADG Code

**1.4.72****transit storage**

storage of dangerous goods for at least 12 hours and not more than five consecutive days, in packages or IBCs that are not opened or used while in the transit storage area, and which are intended for further transport to another location

Note 1 to entry: [Section 4](#) of this document applies to transit storage.

**1.4.73****work permit**

written document that specifies the conditions under which work in a restricted area may be carried out

Section 2 Minor storage

2.1 Scope of section

This Section specifies the criteria for “minor storage” of packaged dangerous goods of mixed classes and the requirements for such storage.

For retail storage of any quantity of dangerous goods, [Section 3](#) applies.

NOTE 1 The underlying concept of this Section is that quantities below a certain level are so small, or are so scattered and separated, that they present little real hazard, add little to a building’s fire load, and are generally unlikely to play a significant part in spreading a fire from place to place. The firefighting facilities required under normal building regulations are expected to cope adequately.

NOTE 2 Workplace safety regulations and guidelines may apply even to quantities defined as “minor storage” in this document.

2.2 Criteria for classification as minor storage

Storage of dangerous goods of mixed classes in commercial or industrial premises, in packages and IBCs, in quantities less than or equal to those given in [Table 2.1](#), is classified as minor storage.

A minor store may be regarded as separate if it is more than 10 m from any other dangerous goods store, except where a regulation or Standard applying to the other store stipulates a greater distance.

The total amount of dangerous goods kept shall not exceed one minor store per 500 m<sup>2</sup> of floor or ground area. Where the floor or ground area exceeds 500 m<sup>2</sup>, minor stores shall be at least 10 m apart. Any arrangement resulting in an undue concentration of minor stores shall be avoided.

Table 2.1 — Maximum minor storage quantities

| Description                                                                                                                                                                                                      | Quantity, kg or L |       |        |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|--------|---------------------|
|                                                                                                                                                                                                                  | PG I              | PG II | PG III | Combustible liquids |
| Total quantity of all dangerous goods                                                                                                                                                                            | 25                | 250   | 1 000  | 1 500               |
| NOTE 1: It is permissible to store, at the same time and in the same area, the maximum allowance for each of all of the Packing Groups.                                                                          |                   |       |        |                     |
| NOTE 2: Where manufactured product is stored, the quantities of manufactured product may be doubled.                                                                                                             |                   |       |        |                     |
| NOTE 3: The maximum quantity of Division 5.2 dangerous goods allowable as minor storage is 10 kg or 10 L.                                                                                                        |                   |       |        |                     |
| NOTE 4: For the purpose of determining minor storage quantities, the following applies:                                                                                                                          |                   |       |        |                     |
| (a) Class 2 dangerous goods in retail packages (e.g. non-refillable lighters, butane lighters, barbecue gas in disposable containers), aerosols, and substances and articles of Class 9, are regarded as PG III. |                   |       |        |                     |
| (b) Dangerous goods of Classification Code 1.4S, in their original packagings, are regarded as PG II.                                                                                                            |                   |       |        |                     |

2.3 Precautions applying to minor storage

The following requirements and recommendations apply to minor storage:

- (a) Any materials that are incompatible, or might react dangerously if mixed, shall be segregated so that the possibility of reaction is minimized.

NOTE 1 [Section 6](#) provides information on segregation.

- (b) The storage area shall be away from any heating or ignition sources.

- (c) The storage area shall be provided with adequate natural or mechanical ventilation, depending on the nature of the substances and the circumstances of their use in accordance with [Clause 5.4.5](#).
- (d) Packages shall be kept closed when not in use. Packages should only be opened in a well-ventilated area conforming to [Clause 5.4.5](#), and, if their contents are flammable, away from any potential ignition sources.
- (e) Packages should be stored so that leaks cannot affect other substances in the store. Liquids should not be stored above powders and solids. Liquids in glass bottles should be stored at lower levels.
- (f) Spill control measures shall be provided where packages are opened and their contents transferred.
- (g) Any spills or leaks shall be cleaned up immediately and disposed of in accordance with [Section 10](#). Contaminated, spilled or leaked material shall not be returned to its original packaging, except for disposal where it is known that this will not increase the risk.
- (h) The transfer of dangerous goods from the store to the point of use shall be carried out to minimize the possibility of spillage or fire.
- (i) Dangerous goods shall not be stored or handled where they could hinder escape from a building in the event of fire.
- (j) Persons handling any dangerous goods shall be informed, trained and supervised in how to safely handle the dangerous goods.
- (k) Packages shall be kept in such a manner as to avoid spillage.
- (l) Stores shall be kept clear of combustible matter and refuse.
- (m) Packages shall be kept on surfaces that are resistant to attack by their contents if spilt.
- (n) Appropriate personal protective equipment shall be worn by personnel involved in product transfer or clean-up operations (see [Clause 7.9](#)).
- (o) A fire extinguisher compatible with the dangerous good stored shall be installed in each minor store. It shall be located so that it is immediately accessible in an emergency, along an exit route.
- (p) A supply of water shall be available at a nearby location, for personal hygiene.

NOTE 2 [Sections 6, 7](#) and [8](#) of this document deal with safety matters that may be pertinent to minor storage but which, for the purposes of such, may be regarded as advisory.

## 2.4 Additional precautions for outdoor minor storage

The following additional requirements apply to outdoor minor storage:

- (a) The ground around the storage area shall be kept clear of combustible vegetation and refuse by at least 3 m.
- (b) Any potential flow of spillage shall be prevented from reaching any protected place, watercourse or boundary by such means as the use of natural ground slope, or the provision of a diversion channel, kerb or bund.
- (c) The store shall be separated from any protected place or property boundary by at least 3 m.

## Section 3 Retail storage

### 3.1 Scope of section

This Section sets out requirements and recommendations for the storage and handling of dangerous goods in the retail sector, where such goods are in retail packages of the volumes allowed by [Table 3.1](#).

NOTE 1 [Appendix A](#) provides details of dangerous goods classes.

NOTE 2 [Sections 6, 7](#) and [8](#) of this document deal with safety matters that may be pertinent to retail storage but which may be regarded as advisory.

### 3.2 Application of section

This Section applies to the retail storage of dangerous goods in retail packages, in quantities up to those listed in [Table 3.2](#). The only dangerous goods in retail stores to which this Section applies are retail packages conforming to [Clause 3.3](#).

Where exchange cylinders of LP Gas are kept, AS/NZS 1596 applies.

Where the dangerous goods being kept at retail premises are in packages whose sizes exceed those allowed in [Table 3.1](#), [Section 5](#) shall apply.

[Clause 3.4](#) specifies general requirements for all types of retail storage. [Clause 3.5](#) provides additional requirements for retail distribution centres in which the quantities of retail packages containing dangerous goods being stored exceed those given in [Table 3.2](#). [Clauses 3.6](#) and [3.7](#) provide additional requirements for the retail storage of pool chemicals and agricultural chemicals respectively.

### 3.3 Retail packages

Dangerous goods in retail packages shall be packed in accordance with the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

The maximum sizes of the inner or sole packages kept as retail packages shall not exceed those given in [Table 3.1](#).

Dangerous goods of Class 1 are limited to inner package sizes that are intended to be sold to the public in a retail store.

Only Class 7 dangerous goods in domestic smoke detectors shall be stored in retail storage meeting the requirements of this Section. No other dangerous goods of Class 7 shall be stored in retail storage.

**Table 3.1 — Maximum sizes of retail packages for dangerous goods**

| Class or division | Application/restrictions                                                 | Maximum size container |
|-------------------|--------------------------------------------------------------------------|------------------------|
| 2.1               |                                                                          | 1 L                    |
| 2.2               |                                                                          | 2.2 L <sup>a</sup>     |
| 2                 | Aerosols or gas cartridges without Division 2.3 or 6.1 subsidiary hazard | 1 L                    |
| 3                 |                                                                          | 20 L                   |
| C1 and C2         | Combustible liquids                                                      | 20 L                   |
| 4.1               | Other than firelighters                                                  | 500 g                  |
| 4.1               | Firelighters                                                             | 3 kg                   |
| 4.3               |                                                                          | 500 g or 500 ml        |
| 4.3               | Solid zinc dust for two-pack metal primers                               | 1 kg                   |

**Table 3.1** (continued)

| Class or division | Application/restrictions                                                                                                                         | Maximum size container  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 5.1               | Pool chlorine in granulated or tablet form (not powdered form)                                                                                   | 10 kg                   |
| 5.1               | Other than pool chlorine                                                                                                                         | 20 kg or 20 L           |
| 5.2               | Automotive filling compounds and two-part epoxy or polyester resins and adhesives in solid or paste form that do not require temperature control | 500 g                   |
| 5.2               | Other substance not requiring temperature control                                                                                                | 125 mL                  |
| 6.1               |                                                                                                                                                  | 20 kg or 20 L           |
| 8                 | PG II                                                                                                                                            | 5 kg or 5 L             |
| 8                 | PG III                                                                                                                                           | 20 kg or 20 L           |
| 9                 | Excluding lithium or sodium batteries                                                                                                            | 20 kg or 20 L           |
| 9                 | Lithium or sodium batteries                                                                                                                      | 50 kg (mass of battery) |

**Table 3.2 — Maximum storage quantities of retail packages**

| Class, division and description                                                                                 | Maximum storage quantity kg or L                                                                                                                                 | Separation requirements                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 in non-refillable containers                                                                                | 100 L                                                                                                                                                            | Aerosols(UN 1950) in an aggregate quantity exceeding 20 l of shall be separated from flammable liquids by 1.5 m<br>Class 2, other than aerosols (UN 1950) shall be separated from flammable liquids by 1.5 m |
| 2.2                                                                                                             | 100 L                                                                                                                                                            |                                                                                                                                                                                                              |
| Aerosols (UN 1950) and other non-refillable pressure containers, e.g. gas cartridges containing flammable gases | 4 000 L, of which no more than 2 000 L are flammable                                                                                                             |                                                                                                                                                                                                              |
| 3                                                                                                               | PG II — no more than 250 L in any 500 m <sup>2</sup> area<br>PG III — no more than 500 L in any 500 m <sup>2</sup> area<br>No more than 200 L in 20 L containers | Flammable liquids shall be separated from Class 2 and aerosols (UN 1950) by 1.5 m and from Class 5.1 goods by 3 m                                                                                            |
| 3 Manufactured product                                                                                          | 10 000 L                                                                                                                                                         |                                                                                                                                                                                                              |
| C1 Combustible liquids                                                                                          | 1 000 L in any 500 m <sup>2</sup> up to a maximum of 3 000L                                                                                                      | —                                                                                                                                                                                                            |
| C2 Combustible liquids                                                                                          | 2 500 L                                                                                                                                                          | —                                                                                                                                                                                                            |
| 4.1                                                                                                             | 1 000 kg or L                                                                                                                                                    | Goods shall be separated from Class 2 and aerosols (UN 1950) by 1.5 m and from Class 5.1 goods by 3 m                                                                                                        |
| 4.3                                                                                                             | 20 kg                                                                                                                                                            | Goods shall not be stored beneath any water-based products, and shall be separated from any water-based products by at least 1.5 m                                                                           |
| 5.1 Granulated pool chlorine                                                                                    | 250 kg at a service station<br>2 000 kg at a general retail shop<br>4 000 kg or L at swimming pool supply shops                                                  | Class 5.1 shall be separated from Class 3 or combustible liquids by 3 m and from foodstuffs by 5 m<br>Different types of pool chemicals shall be separated by at least 1 m or by a solid metal partition     |
| 5.1 Other than pool chlorine                                                                                    | 1 200 kg                                                                                                                                                         |                                                                                                                                                                                                              |
|                                                                                                                 |                                                                                                                                                                  | See Clause 3.6.2 for segregation from pool chemicals                                                                                                                                                         |

**Table 3.2** *(continued)*

| Class, division and description | Maximum storage quantity kg or L                                                           | Separation requirements                                                         |
|---------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 5.2                             | 100 kg                                                                                     | Goods shall be separated from other dangerous goods by at least 3 m             |
| 6.1                             | 250 kg or L at a general retail shop<br>2 500 kg or L at an agricultural chemical supplier | Goods shall be separated by 3 m from other dangerous goods or foodstuffs        |
| 8                               | Sodium hypochlorite — 3 000 L<br>Other — 1 200 kg or L                                     | For sodium hypochlorite, see Clause 3.6.2 for segregation from pool chemicals   |
| 9                               | 4 000 kg or L                                                                              | Includes no more than 5 x Lithium batteries with a mass between 20 kg and 50 kg |

### 3.4 General requirements for retail storage

#### 3.4.1 Design and construction of retail stores

The following requirements apply to retail stores in which dangerous goods are kept:

- (a) The store shall be provided with adequate natural or mechanical ventilation, in order to disperse any dusts, mists or vapours below the concentration which is of occupational health concern or may lead to a flammable atmosphere.

NOTE 1 Adequate ventilation is dependent on the nature of the substance, the circumstances of its use and storage.

- (b) Racks and shelves shall not be loaded beyond their safe load limit. They shall be constructed of materials that are —

- (i) unable to absorb liquids; and
- (ii) compatible with the dangerous goods being kept.

- (c) The design and installation of racking and shelving shall permit ready access to all stock and allow clear access for personnel. Dangerous goods shall be located so as to ensure that there are safe passages to exits and that exits are not blocked.

- (d) Lighting shall be provided in accordance with [Clause 5.4.4\(d\)](#).

NOTE 2 Refer to the NCC for requirements relating to the construction of retail stores in which dangerous goods are kept.

#### 3.4.2 Ventilation

Most retail products have the potential when spilled to create gas or vapour which is heavier than air. Low level cross ventilation shall be provided by either mechanical exhaust ventilation or by natural ventilation, as follows:

- (a) Natural ventilation — Where natural ventilation is used, in addition to low level vents, vents shall also be provided in either the roof or at high level in walls to create an airflow. Vents shall be provided in two opposing walls, except that vents may be provided in one external wall, provided that the wall is at least 6 m long and the opposite wall is not more than 5 m away from it.

Each vent shall have a net free area of at least 0.1 m<sup>2</sup>. There shall be one low-level vent in each 3 m of length of wall, or in each 1.4 m of length of external wall where there is only one external wall. Where only one such vent is required, it shall be central in the length of wall.

Where high level wall vents are used, there shall be an equal area of openings above the highest package, positioned to ensure effective movement of air. Where roof vents are used, they shall provide an equal area of openings and be distributed along the length of the roof. Ridge vents or rotating cowl vents may be used.

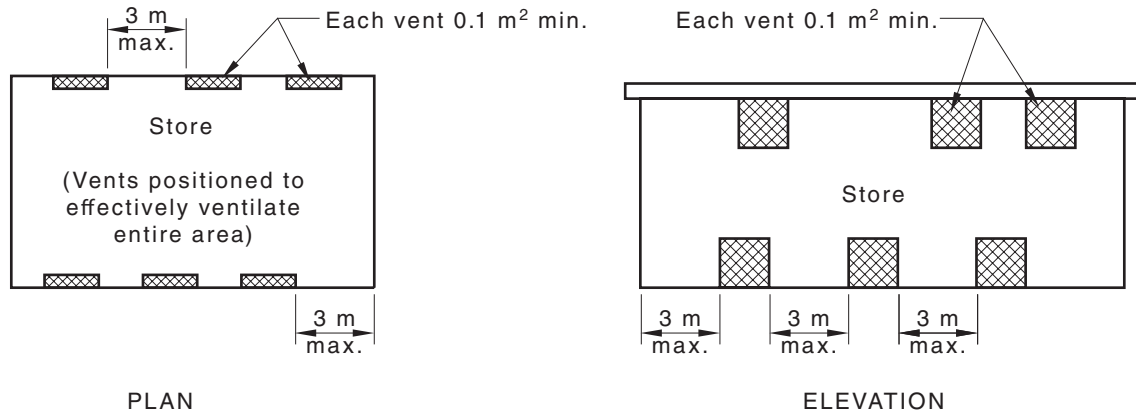


**Figure 3.1 — Store having vents in opposite walls**

- (b) Mechanical ventilation — The termination points within the room for both the fresh air supply and the draw-off ducts shall be—
- (i) immediately above the upper limit of the spillage compound; and
  - (ii) on opposite walls.

The distance between any two inlets or any two outlets shall not exceed 5 m.

NOTE 1 It is recommended that the outlets be located along the longest side of the building for optimum effect.

NOTE 2 If a single fan system is adopted, the fan should be in the exhaust duct.

NOTE 3 The air supply may be in the form of natural ventilation in an external wall at low level, as described in [Clause 3.4.2\(a\)](#).

The system shall be capable of exhausting  $0.3 \text{ m}^3$  per square metre of floor area per minute or  $5 \text{ m}^3/\text{min}$ , whichever is the greater, and the air velocity at the air supply outlet shall exceed  $300 \text{ m/min}$ .

The system shall be designed to provide a safe atmosphere and may operate —

- (i) continuously;
- (ii) whenever work is being carried out in the store;
- (iii) whenever a person is in the store, or
- (iv) in accordance with the requirements or assumptions of a hazardous area classification for the store.

Where the ventilation system does not operate continuously, it shall be activated for such a period as is necessary to ensure a safe atmosphere before any person enters. The ventilation period shall be determined by a written risk assessment. A sign shall be placed outside the entry door prohibiting entry until the ventilation system has been operating for the required period.

### 3.4.3 Security and access

Security and clear access shall be provided in accordance with [Clauses 5.6](#) and [7.2.1](#) respectively.