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The storage and handling of corrosive substances



AS 3780:2023

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Department of Mines, Industry Regulation and Safety, WA
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The storage and handling of corrosive substances

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Preface

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee CH-009, Safe Handling of Chemicals, to supersede AS 3780:2008. This document has been revised to reflect changes in regulatory requirements and control philosophies that have been refined since the publication of the 2008 edition.

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.

This document deals with corrosive substances that are classified as dangerous goods of Class 8, as classified in the UN *Recommendations on the Transport of Dangerous Goods: Model Regulations*.

The objective of this document is to promote the safety of persons, property and the environment where corrosive substances are stored and handled, by providing requirements and recommendations based on industry good practice.

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 figures and tables are deemed to be requirements of this document. Notes that appear in the main text of this document provide information only.

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NOTES

Australian Standard®

The storage and handling of corrosive substances

Section 1 Scope and general

1.1 Scope

This document sets out requirements and recommendations for the safe storage and handling of corrosive substances, i.e. substances that meet the Class 8 classification criteria of the ADG Code.

The document also applies to other dangerous goods that are assigned a Class 8 subsidiary hazard by the ADG Code, except where they are of Class 2. The user of this document should refer to relevant federal, state and territory regulations and determine legal requirements as applicable.

Where a corrosive liquid is also classified as a C1 combustible liquid (GHS flammable liquid Category 4), AS 1940 is a relevant Australian Standard.

This document provides minimum acceptable safety requirements for storage facilities, operating procedures, emergency planning and fire protection. It also provides technical guidance that may assist in the storage and handling of corrosive substances in accordance with the risk management requirements of relevant authorized codes of practice.

NOTE A discussion of the hazards presented by corrosive substances is provided in [Appendix A](#).

1.2 Exclusions

This document does not apply to the following:

- (a) Gases having a Class 8 subsidiary hazard, e.g. chlorine.
- (b) Corrosive materials that do not meet the criteria for Class 8 dangerous goods.

NOTE 1 This includes materials which have GHS classification of eye damage/irritation Category 1, but do not meet the GHS classifications of skin corrosion Category 1A to 1C or corrosive to metals Category 1. Such materials are labelled with the GHS corrosive pictogram on inner and sole packaging.

NOTE 2 While excluded from the scope, when determining risk control for these materials reference can be made to parts of this document dealing with eyewash stations and [Sections 8](#) and [11](#).

- (c) The transport of corrosive substances, which is dealt with in the ADG Code.
- (d) The bulk transfer of corrosive substances between a ship and an onshore store, which is controlled by the relevant port authority. AS 3846, should be consulted.
- (e) The manufacture of corrosive substances.

NOTE 3 Storage and handling of corrosive raw materials, intermediates or finished products on these facilities are not excluded from this standard

1.3 Application

This document applies in locations that are generally industrial, commercial or rural in nature.

NOTE 1 An installation may come under the regulatory control of several authorities having differing areas of responsibility, and an approval from one authority does not necessarily constitute an approval from others.

NOTE 2 The National Construction Code (NCC) applies to all matters relating to building works.

1.4 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 1210, *Pressure vessels*

AS 1345, *Identification of the contents of pipes, conduits and ducts*

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

AS 1692, *Steel tanks for flammable and combustible liquids*

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

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

AS 2809.1, *Road tank vehicles for dangerous goods, Part 1: General requirements for all road tank vehicles*

AS 2809.4, *Road tank vehicles for dangerous goods, Part 4: Road tank vehicles for toxic, corrosive or ammonium nitrate emulsion, suspension or gel cargoes*

AS 2865, *Confined spaces*

AS 3600, *Concrete structures*

AS 4100, *Steel structures*

AS 4775, *Emergency eyewash and shower equipment*

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

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

AS/NZS 1680.1, *Interior and workplace lighting, Part 1: General principles and recommendations*

AS/NZS 1680.2.4, *Interior and workplace 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 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 4501.2, *Occupational protective clothing, Part 2: General requirements*

AS/NZS 4766, *Rotationally moulded buried, partially buried and non-buried storage tanks for water and chemicals*

AS/NZS 60079 (all parts), *Explosive atmospheres*

American Petroleum Institute (API). *Std 620, Design and Construction of Large, Welded, Low-pressure Storage Tanks*

DIN DVS 2205, (all parts), *Thermoplastic tanks*

EN 12573 (all parts), *Welded static non-pressurized thermoplastic tanks*

EN 1993-4-1, *Eurocode 3: Design of steel structures, Part 4-1 Silos*

ACI 313, *Design Specification for Concrete Silos and Stacking Tubes for Storing Granular Materials and Commentary*

American Petroleum Institute (API). *Std 650, Welded Tanks for Oil Storage*

INTERNATIONAL MARITIME ORGANIZATION (IMO). *International Convention for Safe Containers (CSC)*

International Maritime Organisation (IMO). *IMDG Code, International Maritime Dangerous Goods Code*

National Transport Commission (NTC). *Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)*

1.5 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

1.5.1

ADG code

Australian Code for the Transport of Dangerous Goods by road and rail, also known as the Australian Dangerous Goods Code, published by the National Transport Commission

1.5.2

boundary

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

1.5.3

bulk

in relation to a hazardous chemical, any quantity of a hazardous chemical that is either —

- (a) in a container with a capacity exceeding 500 L or net mass of more than 500 kg; or
- (b) if the hazardous chemical is a solid — an undivided quantity exceeding 500 kg

1.5.4

bund

impervious embankment or wall that may form part or all of the perimeter of a compound

Note 1 to entry: The joint between the bund and floor of the compound needs to be impervious.

1.5.5

capacity

1.5.5.1

of a packaging (including IBCs)

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

Note 1 to entry: The normal or nominal capacity of a container is less than its full capacity, to allow for ullage.

1.5.5.2

of a compound

total internal volume of the compound, allowing for any structures, tank foundations etc. below the bund height

Note 1 to entry: Where a compound contains more than one tank, allowance for the volume of tanks up to the bund height needs to be made.

1.5.5.3 of a tank

<tank capacity (overfill level or tank design capacity)> point at which either the tank will suffer mechanical damage or product will be lost from the tank

Note 1 to entry: API 650 defines this as the level to the top of the shell or to the bottom of any overflow limiting the filling height (with provision for floating roofs and seismic wave action).

<tank normal capacity (normal fill level)> maximum level to which the tank will intentionally be filled on a routine basis, using the normal process control system, sometimes referred to in Australia as the safe fill level

<tank rated capacity> level below the overfill level that will allow time for any action necessary to prevent the maximum capacity from being reached/exceeded

Note 2 to entry: This is determined by the time required to take the appropriate action necessary to completely shut down or divert product flow before the level of product in the tank reaches the overfill level.

Note 3 to entry: API standards and other documents use “safe fill level” as an alternative term for “rated capacity”.

Note 4 to entry: See [Figure 1.5.6.3](#) for an illustration of tank capacity.

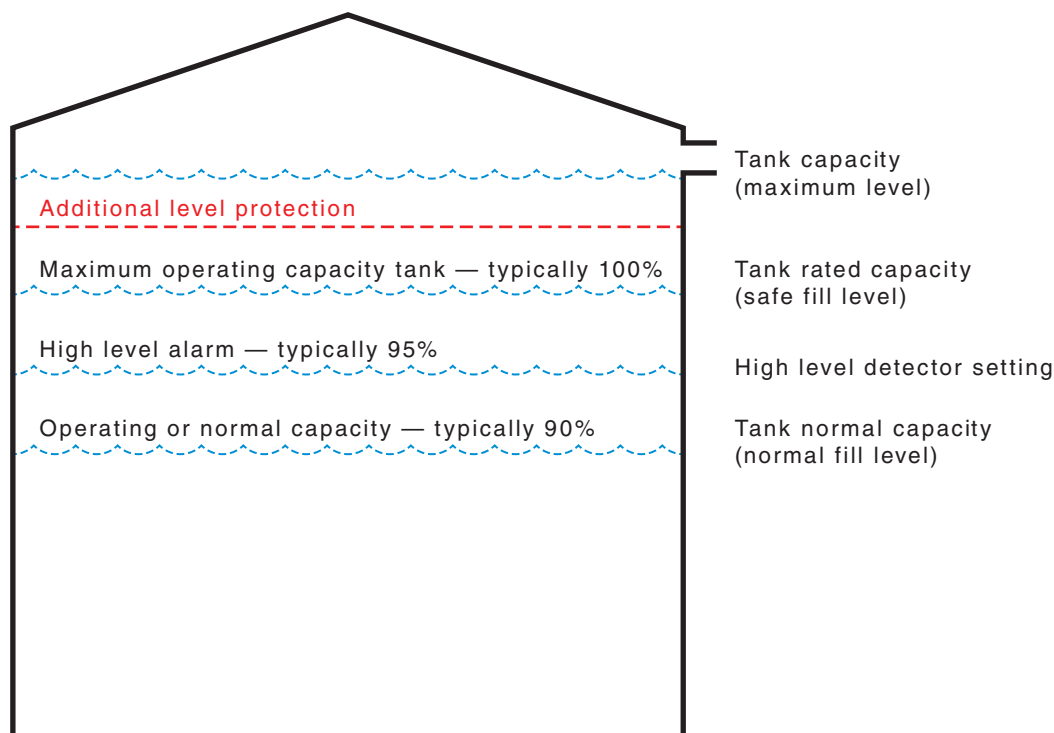


Figure 1.5.6.3 — Tank capacity

1.5.6 compatible

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

- (a) are not incompatible (as defined in [Clause 1.5.17](#)); or
- (b) do not react dangerously (as defined in [Clause 1.5.33](#))

**1.5.7
compound**

area bounded by natural ground contours or by a bund, and sufficiently impervious to retain any fire water, spillage or leakage

Note 1 to entry: This includes the floor of the compound.

Note 2 to entry: A containment vessel, pit or tank may be used for this purpose.

**1.5.8
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

**1.5.9
combustible liquid**
refer to AS 1940**1.5.10
corrosive substances**

substances that meet the criteria in Class 8 corrosive substances in the ADG Code and that, by chemical action, will cause irreversible damage to the skin, or in the case of leakage, will materially damage or even destroy, other goods or the means of transport

**1.5.11
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*.

**1.5.12
environmentally sensitive area**

area sensitive to damage from dangerous goods, which includes, but is not limited to —

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

**1.5.13
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.

1.5.14

Globally Harmonized System

GHS

latest revised edition of classification and labelling of chemicals, published by the United Nations

Note 1 to entry: different jurisdictions within Australia may use different revisions of the GHS.

1.5.15

hazardous area

area in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of potential ignition sources

Note 1 to entry: A classification system for hazardous areas is given in the AS/NZS 60079 series of standards.

1.5.16

incompatible

dangerous goods and other goods that are —

- (a) likely to interact with the dangerous goods so as to increase the risk when mixed or otherwise brought into contact with the dangerous goods;
- (b) listed in the ADG Code as being incompatible; or
- (c) declared by the regulatory authority as being incompatible

in relation to packaging or transfer equipment, a container or item of equipment that is constructed of a material that is likely to interact with the dangerous goods such that it is weakened or damaged, to the extent that risk increases

Note 1 to entry: This definition should be read in conjunction with [Clause 1.5.33](#).

Note 2 to entry: Concentrated strong acids and concentrated strong alkalis are incompatible. Dilute solutions of these may not be incompatible — expert advice can be sought to clarify this.

Note 3 to entry: Acids and gas cylinders are an example of incompatibility.

1.5.17

installation

facilities on a site that are related to the storage or handling of corrosive substances

1.5.18

intermediate bulk container

IBC

rigid or flexible portable packaging for the transport of dangerous goods, other than packaging, specified in Chapter 6.1 of the ADG Code, that —

- (a) has a capacity of —
 - (i) not more than 3.0 m³ (3 000 l) for solids and liquids of packing groups II or III;
 - (ii) not more than 1.5 m³ for solids of packing group I when packed in flexible, rigid plastics, composite, fibreboard and wooden IBCs; and
 - (iii) not more than 3.0 m³ 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 tests in Chapter 6.5 of the ADG Code; and
- (d) conforms to the ADG Code

Note 1 to entry: The maximum capacity of IBC covered by this document is —

- (a) in a package store — 1.6 m³;
- (b) as a tank — as in [Clause 1.5.19](#) (a).

Note 2 to entry: Corrosive liquids Class 8 PG I are not permitted for transport in IBCs. IBCs should not be used for storage of PG I

1.5.19

large packaging

packaging consisting of an outer packaging that contains articles or inner packaging and —

- (a) is designed for mechanical handling; and
- (b) exceeds 400 kg net mass or 450 L capacity but has a volume of not more than 3 m³

1.5.20

manifest

document intended to advise emergency services which includes a written summary of the hazardous chemicals used, handled or stored at the premises, along with details of tank and bulk storages and a plan of the premises

1.5.21

may

indicates the existence of an option

1.5.22

minor storage

storage of corrosive substances, in various locations, in quantities conforming to the criteria set out in [Table 2.2](#) of this document

1.5.23

non-combustible

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

1.5.24

on-site protected place

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

1.5.25

package

hazardous chemicals in a container with —

- (a) a capacity not exceeding 500 L; or
- (b) a net mass not exceeding 500 kg

1.5.26

packaging

one or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions

1.5.27
packing group
PG

one of three hazard groups into which dangerous goods (of Classes other than 1, 2 and 7, Divisions 5.2 and 6.2 and self-reactive substances of Division 4.1) are designated in the ADG Code, in decreasing order of hazard, by the Roman numerals "I" (high danger), "II" (medium danger) and "III" (low danger)

Note 1 to entry: The UN *Recommendations on the Transport of Dangerous Goods: Model Regulations* provides criteria for the assignment of packing groups, and a list of those already assigned. The ADG Code also provides this information.

1.5.28
pipework

assembly of pipes, pumps, hoses, valves, fittings and associated appliances used in receiving, handling or exporting bulk goods

1.5.29
premises

area under the control of the occupier

1.5.30
protected place

place recognized or determined to be in need of protection from hazards of dangerous goods

Note 1 to entry: Examples of protected place include —

- (a) dwelling, place of worship, public building, school or college, hospital, theatre, or any building or open area in which persons are accustomed to assembling, whether within or outside the property boundary of the installation;
- (b) factory, workshop, office, store, warehouse, shop, or building where persons are employed;
- (c) accumulation of flammable or combustible materials of a type and quantity sufficient to constitute a significant heat-radiation hazard in the event of fire in those materials;
- (d) ship lying at permanent berthing facilities;
- (e) any storage facility for dangerous goods, other than minor storage, outside the property boundary of the installation;
- (f) environmentally sensitive area.

1.5.31
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.

1.5.32
react dangerously

reaction of substances, to react in a manner that directly creates a hazard due to the reaction —

- (a) being violent;
- (b) producing an explosion;
- (c) producing a potentially explosive combination of products;
- (d) producing fire or rapid evolution of heat; or
- (e) producing toxic vapour or toxic gas

Note 1 to entry: This definition should be read in conjunction with [Clause 1.5.12](#).

Note 2 to entry: Examples of substances that react dangerously are acids and cyanides; concentrated, strong acids and alkalis; and acids and hypochlorites.

1.5.33

regulatory authority

statutory authority responsible for administration of control of the storage, transport and use of Class 8 substances

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

1.5.34

restricted area

area to which access is only available to persons authorized by the occupier

Note 1 to entry: For the purposes of this document, a dangerous goods store is a restricted area.

1.5.35

safety data sheet

SDS

document that provides information on the identification, health hazards, precautions for use and the safe handling of a specific chemical product, and which conforms to Safe Work Australia, *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.

1.5.36

screen wall

structurally-sound wall that —

- (a) is impervious to liquid and vapour;
- (b) is constructed of materials that are substantially immune to attack by the corrosive substances kept; and
- (c) may act as a shield or deflection barrier for liquid or vapour

1.5.37

separation

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

1.5.38

shall

indicates that a statement is mandatory

1.5.39

should

indicates a recommendation

1.5.40

subsidiary hazard

reference to any additional hazard that the dangerous goods might have, indicated by the subsidiary hazard number to which the dangerous goods are assigned. Dangerous goods are assigned a subsidiary hazard if they —

- (a) satisfy the criteria specified in the UN *Manual of Tests and Criteria* for their assignment to a subsidiary hazard;
- (b) are assigned a subsidiary hazard in the ADG Code; or
- (c) are assigned a subsidiary hazard by the regulatory authority

Note 1 to entry: Subsidiary hazard was previously referred to as subsidiary risks/subrisks.

1.5.41

tank

container for liquids, other than a packaging

Note 1 to entry: See [Clause 6.2](#).

1.5.42

tanker vehicle

road tank vehicle or a rail tank vehicle, as defined in the ADG Code

1.5.43

transfer point

point where the pipework from or to a tank terminates to enable hose connection to road tankers, portable tanks and IBCs

1.5.44

transit storage

storage of corrosive substances, in accordance with the requirements of [Section 3](#) of this document, held in transit for not less than 12 h and not more than five normal working days, where such substances are intended for further transport to another location

1.5.45

work permit

written permit that stipulates the conditions under which work within a specified area may be carried out

1.6 Application of sections

[Sections 1, 6, 7, 8](#) and [9](#) set out general requirements that apply to the storage and handling of corrosive substances greater than minor storage.

[Section 2](#) sets out conditions, quantities and requirements for minor storage of corrosive substances. [Sections 1](#) and [9](#) of this document also apply to minor storage.

For transit storage (as defined in [Clause 1.5.45](#)), only [Sections 1, 3](#) and [9](#) apply.

[Section 5](#) sets out specific requirements for the storage and handling of packages containing corrosive substances. [Section 6](#) provides specific requirements for storage and handling of tanks containing corrosive liquids. [Section 7](#) provides specific requirements of storage and handling of corrosive solids. Specific operational and personnel safety requirements for packaged and bulk corrosive substances are given in [Clauses 8.8](#) and [8.9](#) respectively.

1.7 Placarding, signage, marking and labelling of containers, equipment, installations and storage areas

Containers of corrosives shall be marked and labelled.

NOTE 1 Refer to Federal, State or Territory legislation for additional requirements related to labelling.

NOTE 2 See [Appendix D](#) for more information on placarding, marking and labelling.

Section 2 Minor storage

2.1 Scope of section

This section specifies the criteria for “minor storage” classification for corrosive substances and the requirements for such storage.

2.2 Criteria for classification as minor storage

Storage of corrosive substances in packages, in quantities not exceeding those set out in [Table 2.2](#) and separated from any other storage by at least 10 m, may be regarded as minor storage.

NOTE Minor storage is intended for corrosive substances contained in packages. The maximum container size of a package (see [Clause 1.5.26](#)) is the following:

- (a) For liquids, a capacity not exceeding 500 L.
- (b) For solids, a net mass not exceeding 500 kg.

Units of kilograms are applicable to solids and units of litres to liquids. The maximum quantities specified in terms of “kg or L” are the sum of the number of litres of liquid substances and the number of kilograms of solid substances.

Table 2.2 — Maximum aggregate quantities of corrosive substances permissible as minor storage

Type of premises	Maximum quantity, kg or L ^a		
	PG I	PG II	PG III
Within a dwelling	2.5	12.5	50
Residential premises (dwellings and outbuildings) ^b	5	25	100
All other premises	50	250	1 000 ^c
^a Total quantity of substances of all packing groups shall not exceed the maximum quantity specified for the least dangerous packing group being kept. ^b Quantities in residential premises include the quantities in a dwelling. ^c Maximum container capacity 500 L/kg.			

2.3 Precautions for minor storage

The following requirements apply to minor storage:

- (a) A supply of water shall be available at a nearby location.
- (b) Ventilation shall be provided for package storage and handling areas to allow work to be carried out without risk to health and safety.
- (c) Packages shall not be kept near incompatible substances or substances with which they will react dangerously.
- (d) Packages shall be kept away from sources of heat.
- (e) Packages shall be kept securely closed when not in use.
- (f) Packages shall be kept so as to avoid spillage.
- (g) Packages shall be kept on surfaces which, in the event of spillage, are resistant to damage by the contents of the packages.

(h) Spillage-retention measures shall be provided at locations where packages are likely to be opened or their contents transferred. Spillage retention shall be based on the loss of contents of the largest package size.

(i) The contents of a package shall not be transferred to any other container for storage unless the latter is intended for the storage of the corrosive substance and is clearly marked to indicate the identity and hazard potential of that substance.

NOTE 1 Where the contents of a package have been transferred into another container, and the resultant package is to be used for transportation, refer to the relevant authority for requirements relating to packaging conforming to the ADG Code.

(j) Personal protective equipment shall be worn by any person involved in product transfer operations, e.g. decanting or filling in accordance with the SDS.

(k) Any spills or leaks shall be cleaned up immediately and disposed of in accordance with [Section 9](#).

(l) Wastes shall be disposed of in accordance with [Section 11](#).

(m) Storage areas shall be secured against unauthorized entry.

(n) Means shall be implemented to prevent liquids entering drains, sewers and neighbouring lands.

NOTE 2 [Sections 9](#) and [10](#) 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 being advisory.

Section 3 Transit storage

3.1 Scope of section

This section specifies requirements for the temporary storage of corrosive substances and of other dangerous goods being held in the storage area with them, when in transit storage, as defined in [Clause 1.5.44](#).

This section applies to —

- (a) the parking of vehicles that have either been preloaded in preparation for delivery, or where, for operational reasons, the transport journey is broken; and
- (b) freight containers, tanks or bulk solids containers awaiting pickup for transport; and
- (c) stacks of packages and IBCs awaiting pickup for transport.

The following sections of this document apply to transit storage:

- (i) [Section 8](#) — Operational and personnel safety.
- (ii) [Section 9](#) — Emergency management.
- (iii) [Section 10](#) — Fire protection.

3.2 Delineation of transit storage areas

Areas used for the transit storage of corrosive substances shall be deemed to be separate areas if apart from each other and from other storage areas by at least 15 m.

3.3 Requirements for transit storage

The following requirements apply to the transit storage of corrosive substances and of other dangerous goods being held in the storage area with them:

- (a) The quantity of corrosive substances held in each transit storage area shall not exceed 200 t. Where corrosive substances are held in the one area with other dangerous goods, the aggregate quantity shall not exceed 200 t or any lower limit imposed by a Standard applicable to the other dangerous goods.
- (b) Dangerous goods that are not permitted by the ADG Code to be stowed together on the same vehicle shall be segregated from each other by a minimum distance of 5 m while they are being held in a transit storage area.
- (c) Except when in freight containers, stacks of packages and IBCs in a transit storage area shall —
 - (i) each not exceed 25 t;
 - (ii) be accessible from all sides; and
 - (iii) be segregated from each other by at least 5 m.
- (d) Freight containers, tanks or bulk solids containers containing corrosive substances in a transit storage area shall —
 - (i) not be stacked more than two containers high and two containers deep;
 - (ii) where stacked two containers deep, be provided with access to both sides of each stack;

- (iii) not be in the same vertical stack as any container of other classes of dangerous goods; and
 - (iv) be separated from containers of other classes of dangerous goods by at least 3 m.
- (e) Spillage catchment and clean-up facilities shall be provided for the site. They shall be capable of handling at least 100 % of the capacity of the largest tank, freight container, IBC or tanker compartment or 10 % of the total packages in the area.
- NOTE 1 In order to facilitate the management of emergencies, the compound capacity should be about 10 % greater than the minimal values specified above.
- (f) The base of the transit storage area shall be impervious and designed to retain any spillage.
 - (g) Parked road vehicles loaded with corrosive substances shall be separated from any other loaded vehicles by at least 3 m, and from any other dangerous goods stores within the area by at least 5 m.
 - (h) Access and escape routes shall be clearly defined and kept clear.
 - (i) All dangerous goods and freight containers shall be marked in accordance with the ADG Code. Transport documentation in accordance with the ADG Code shall be available.
 - (j) Transit storage areas shall be kept clear of any extraneous matter.
- NOTE 2 Transit storage areas should be marked on the scale site plan and where goods are left outside of work hours, transport documentation should be placed in the Emergency Information Cabinet.
- (k) Individual package, IBC, freight container, portable tank or bulk container shall not remain in transit storage for more than five normal working days. After this time individual items shall be stored in accordance with [Section 5,6](#) or [7](#) as appropriate. The area used for transit storage is not limited by any time period.

Section 4 Loading and unloading areas

4.1 Scope of section

This section specifies requirements for areas in which corrosive substances or other dangerous goods are handled when loading or unloading vehicles, including transferring from stores to vehicles and from vehicles to stores.

This section applies to packages and IBCs. Portable tanks placed on or removed from vehicles are subject to this section and [Clause 6.6](#). See [Clause 6.8](#) for road tankers, including portable tanks which remain on a vehicle during loading or unloading.

The following sections of this document apply to loading and unloading areas:

- (a) [Section 8](#) — Operational and personnel safety.
- (b) [Section 9](#) — Emergency management
- (c) [Section 10](#) — Fire protection.

4.2 Specifications for loading and unloading areas

Areas used as loading and unloading areas shall be large enough to accommodate any vehicle to be loaded or unloaded, along with any associated mechanical handling equipment, and their movement.

A traffic plan shall be prepared. It shall include measures to separate pedestrians from moving vehicles and equipment.

Dangerous goods shall not be present in non-working hours, nor remain in the area at the end of the shift, nor for longer than a 12-h period.

NOTE This requirement is the basis for non-inclusion in the site manifest.

Dangerous goods should remain in the area for the minimum time possible.

IBCs and packages may be placed on the ground in loading and unloading areas prior to loading vehicles or prior to moving containers to a storage area or installation. The ground should be impervious and designed to retain any spillage or drain to a containment for environmental reasons.

Section 5 Storage and handling of packages

5.1 Scope of section

This section sets out requirements and recommendations on the storage and handling of packages of corrosive substances. It applies to quantities greater than those allowed as minor storage.

NOTE 1 This section does not apply where [Section 3](#) is applicable.

NOTE 2 Large packaging and intermediate bulk containers (IBCs) having a capacity not exceeding 1.6 m³ may be stored and handled in accordance with this section in the same manner as packages, provided that the IBCs or large packaging have all openings closed at all times during such storage and handling.

5.2 Types of package stores

An installation for storing or handling packaged corrosive substances may be one of the following:

- (a) A room or enclosure or area within a building.
- (b) A roofed structure or room attached to an external wall of another building.
- (c) A freestanding, roofed structure or building (not attached to any other building).
- (d) A designated open-air location.
- (e) An indoor storage cabinet.

5.3 Location, separation and segregation

5.3.1 Corrosive substances having subsidiary hazard

Where the corrosive substance being kept in packages has one or more subsidiary hazards, reference shall be made to the Australian Standards relevant to the classes or divisions of those risks. The greatest specified separation and segregation distances shall apply.

5.3.2 Separation of stores from protected places

With due regard being given to [Clause 5.3.1](#) and except for storage in cabinets, all package stores of corrosive substances shall be separated from protected places by not less than the distances set out in [Table 5.3.2](#).

Table 5.3.2 — Minimum separation of package stores from protected places

Minimum distance from protected places, m					
Stores where packages are opened			Stores where packages remain closed		
PG I	PG II	PG III	PG I	PG II	PG III
10	5	3	5	3	3

NOTE Where separation distances are applied to on-site protected places that are an integral part of the storage, processing or handling of corrosive substances, such distances may be reduced subject to risk identification, assessment and control.

Separation distances may be measured laterally around an intervening screen wall, provided that —

- (a) where the height of the store is greater than or equal to that of the protected place, the wall shall extend at least 1 m above the highest container in the store;
- (b) where the height of the store is less than that of the protected place, the wall shall extend at least 1 m above the protected place or extend as a roof above the store;