AS 1894—1997
Reconfirmed 2021

Australian Standard®

The storage and handling of non-flammable cryogenic and refrigerated liquids

This Australian Standard was prepared by Committee CH/9, Safe Handling of Chemicals. It was approved on behalf of the Council of Standards Australia on 18 July 1997 and published on 5 November 1997.

The following interests are represented on Committee CH/9:

Air Conditioning and Refrigeration Wholesalers Association

Australasian Railway Association

Australian Chemical Specialties Manufacturers Association

Australian Conservation Foundation

Australian Council of Trade Unions

Australian Fire Authorities Council

Australian Institute of Petroleum

Australian Paint Manufacturers Federation

Department for Industrial Affairs, S.A.

Department of Defence, Australia

Department of Minerals and Energy, W.A.

Environment Protection Authority of N.S.W.

Institution of Engineers, Australia

Melbourne Water

National Occupational Health and Safety Commission, Australia

Plastics and Chemicals Industry Association, Australia

Victorian WorkCover Authority

Work Health Authority N.T.

WorkCover New South Wales

Workplace Standards Authority, Tasmania

Additional interests participating in preparation of Standard:

Manufacturers, distributors and industrial users of cryogenic and refrigerated liquids

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Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 96189.

STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 1894—1997
The storage and handling of non-flammable cryogenic and refrigerated liquids

RECONFIRMATION NOTICE

Technical Committee CH-009 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 04 January 2021.

The following are represented on Technical Committee CH-009:
Accord Australasia Ltd
Australasian Fire and Emergency Service Authorities Council
Australasian Institute of Dangerous Goods Consultants
Australian Institute of Petroleum
Australian Logistics Council
Australian Paint Manufacturers Federation
Better Regulation Division
Chemistry Australia
ComCare (Commonwealth Government)
Department of Mines, Industry Regulation and Safety WA
Engineers Australia
Institution of Chemical Engineers
SafeWork SA
WorkSafe New Zealand

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PREFACE

This Standard was prepared by the Standards Australia/Standards New Zealand Committee CH/9, Safe Handling of Chemicals, to supersede AS 1894—1976, *Code of practice for the safe handling of cryogenic fluids*.

This Standard deals with non-flammable cryogenic and refrigerated liquids of Class 2.2 (with or without Subsidiary Risk of 5.1), as classified in the UN *Recommendations on the Transport of Dangerous Goods* and listed in the ADG Code.

The Standard has been revised in order to ensure its technical information is in accordance with international best practices, and the opportunity has been taken to arrange the document into a format consistent with other Australian Standards for the storage and handling of dangerous goods.

The revision process has led to some major changes in this new edition, which are as follows:

(a) Separation distances have been comprehensively reviewed. Particular attention has been paid to the separation of potential sources of leakage, such as valves and connections, and to the properties of the cryogenic and refrigerated liquids being stored.

(b) The Sections addressing operational and personnel safety, emergency management, fire protection and disposal have been aligned with the requirements specified in other Australian Standards for the storage and handling of dangerous goods.

(c) A Section dealing with the storage and handling of non-flammable cryogenic or refrigerated liquids in portable dewars and portable pressure flasks has been developed.

(d) The title has been changed to better reflect the contents of the Standard and align it with the range of other Australian Standards for the storage and handling of dangerous goods.

The series covering the storage and handling of dangerous goods presently comprises the following Standards:

AS

1940 The storage and handling of flammable and combustible liquids

2022 Anhydrous ammonia—Storage and handling (known as the SAA Anhydrous Ammonia Code)

2507 The storage and handling of pesticides

2714 The storage and handling of hazardous chemical materials—Class 5.2 substances (organic peroxides)

2927 The storage and handling of liquefied chlorine gas

3780 The storage and handling of corrosive substances

3961 Liquefied natural gas—Storage and handling

4081 The storage, handling and transport of liquid and liquefied polyfunctional isocyanates

4326 The storage and handling of oxidizing agents

4332 The storage and handling of gases in cylinders

AS/NZS

1596 Storage and handling of LP Gas

4452 The storage and handling of toxic substances

This Standard is a result of a consensus amongst Australian and New Zealand representatives on the Joint Committee that it be produced as an Australian Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of appendices to which they apply. A ‘normative’ appendix is an integral part of the Standard, whereas an ‘informative’ appendix is for information and guidance only.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

Notes that appear in the main text of this Standard are intended to provide information only.

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The storage and handling of non-flammable cryogenic and refrigerated liquids

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE This Standard sets out requirements and recommendations for the storage and handling of non-flammable cryogenic liquids at temperatures below −90°C and refrigerated liquids at or below −15°C, of Class 2.2, in quantities of at least 50 L water capacity and 50 kPa (gauge) working pressure, up to and including 200 000 L water capacity. It also provides guidelines for temporary installations.

Although carbon dioxide and nitrous oxide are not true cryogenic liquids, they are covered by this Standard. Refrigerant gases that have a halogenated hydrocarbon component are not intended to be covered by this Standard.

NOTES: The properties of low-temperature liquefiable gases covered by this Standard are outlined in Appendix A.

This Standard does not address the detailed design of vessels or equipment used for the production, transport and storage of cryogenic and refrigerated liquids, nor the precautions and equipment that might be necessary in large-scale production and processing plants.

NOTES:

1 Advice supplementary to that provided in this Standard might need to be sought from the supplier of the goods.

2 A discussion of the hazards presented by cryogenic and refrigerated liquids is provided in Appendix B.

The transport of cryogenic and refrigerated liquids is covered by the ADG Code. Requirements for road tankers for cryogenic liquids are addressed in AS 2809.6.

1.2 APPLICATION This Standard applies to the storage of non-flammable cryogenic and refrigerated liquids in pressure vessels that conform to AS 1210 or equivalent Standards. It also applies to the ancillary equipment associated with the installation.

This Standard applies in locations that are generally industrial or commercial in nature. In laboratories, the provisions of this Standard apply in addition to those of AS/NZS 2243.2 and AS 2243.10. In hospitals, the provisions of this Standard are in addition to those of AS 2896.

NOTES:

1 An installation can 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 the others.

2 Cognizance of the relevant requirements of the *Building Code of Australia* (BCA) is necessary for all matters relating to building works.

This Standard does not apply to home therapy, or to vessels of less than 50 L water capacity and less than 50 kPa (gauge); however, the safety precautions given in this Standard should be considered.