

Australian/New Zealand Standard™

**The storage and handling of liquefied
chlorine gas**



Standards Australia



STANDARDS
NEW ZEALAND
Te Kaitiaki Take Kōwhiri

AS/NZS 2927:2001

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CH-009, Safe Handling of Chemicals. It was approved on behalf of the Council of Standards Australia on 16 March 2001 and on behalf of the Council of Standards New Zealand on 27 April 2001. It was published on 5 May 2001.

The following interests are represented on Committee CH-009:

Agsafe Australia
Air Conditioning and Refrigeration Wholesalers Association
Australasian Fire Authorities Council
Australian Chemical Specialties Manufacturers Association
Australian Institute of Petroleum
Australian Paint Manufacturers Federation
Department for Administrative and Information Services, S.A.
Department of Industries and Business, N.T.
Department of Infrastructure, Energy and Resources, Tasmania
Department of Minerals & Energy, W.A.
Environment Protection Authority of N.S.W.
Institution of Engineers Australia
National Occupational Health & Safety Commission, Australia
The New Zealand Chemical Industry Council
New Zealand Fire Service
Plastics and Chemicals Industries Association, Australia
Tranz Rail, New Zealand
Victorian WorkCover Authority
WorkCover New South Wales

Additional interests participating in the preparation of this Standard:

Australian Industrial Gas Manufacturers Association
Water Corporation Western Australia
Water authorities and corporations
Manufacturers, suppliers and industrial users of chlorine
Manufacturers and suppliers of equipment for use with chlorine

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

Australian/New Zealand Standard™

The storage and handling of liquefied chlorine gas

Originated as AS 2927—1987.
Jointly revised and designated AS/NZS 2927:2001.
Reissued incorporating Amendment No. 1 (November 2001).

COPYRIGHT

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 3827 3

PREFACE

This Standard was prepared by Standards Australia/Standards New Zealand Committee CH-009, Safe Handling of Chemicals, to supersede AS 2927—1987, *The storage and handling of liquefied chlorine gas*.

This Standard incorporates Amendment No. 1 (November 2001). The change required by the Amendment is indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to promote the safety of persons and property where chlorine is stored or handled in its gaseous or liquefied forms, by providing requirements and recommendations that are based on industry best practices.

This edition has been reformatted to improve clarity and to align with the other published Standards for the storage and handling of dangerous goods. Attention has been paid to better alignment with the requirements of the various state, territory and national regulatory authorities and emergency services, as well as the various publications of the National Occupational Health and Safety Commission (NOHSC).

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

AS

1894	The storage and handling of non-flammable cryogenic and refrigerated liquids
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 agricultural and veterinary chemicals
2714	The storage and handling of hazardous chemical materials—Class 5.2 substances (organic peroxides)
3780	The storage and handling of corrosive substances
3846	The handling and transport of dangerous cargoes in port areas
3961	Liquefied natural gas—Storage and handling
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
3833	The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers
4081	The storage and handling of liquid and liquefied polyfunctional isocyanates
4452	The storage and handling of toxic substances
4681	The storage and handling of Class 9 (miscellaneous) dangerous goods and articles

Australian and New Zealand references are separated by a slash (/).

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

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

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

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	6
1.2 APPLICATION	6
1.3 REFERENCED DOCUMENTS.....	6
1.4 NEW DESIGNS AND INNOVATIONS	7
1.5 DEFINITIONS.....	7
1.6 CLASSIFICATION OF CHLORINE.....	10
1.7 MARKING AND LABELLING OF CONTAINERS.....	10
1.8 SECURITY OF INSTALLATIONS	10
SECTION 2 MINOR STORAGE	
2.1 SCOPE OF SECTION	11
2.2 CRITERIA FOR CLASSIFICATION AS MINOR STORAGE	11
2.3 REQUIREMENTS APPLICABLE TO MINOR STORAGE	11
2.4 OUTDOOR MINOR STORAGE.....	12
2.5 INDOOR MINOR STORAGE.....	12
2.6 FIRST AID	12
SECTION 3 LOCATION, DESIGN AND CONSTRUCTION OF CHLORINE INSTALLATIONS	
3.1 SCOPE OF SECTION	13
3.2 APPLICATION	13
3.3 LOCATION, DESIGN AND CONSTRUCTION OF CHLORINE INSTALLATIONS	13
3.4 ADDITIONAL REQUIREMENTS FOR OUTDOOR INSTALLATIONS	15
3.5 ADDITIONAL REQUIREMENTS FOR INDOOR INSTALLATIONS.....	16
SECTION 4 STORAGE AND HANDLING EQUIPMENT FOR CHLORINE	
4.1 SCOPE OF SECTION	18
4.2 CONTAINERS	18
4.3 CHLORINATORS.....	18
4.4 VAPORISERS (EVAPORATORS)	19
4.5 PIPING SYSTEMS.....	21
4.6 VALVES	24
4.7 JOINTS AND FITTINGS	24
4.8 PLANT SAFETY EQUIPMENT	25
SECTION 5 OPERATIONAL AND PERSONNEL SAFETY	
5.1 SCOPE OF SECTION	28
5.2 OPERATION OF THE INSTALLATION	28
5.3 MEDICAL EXAMINATION.....	28
5.4 PERSONNEL TRAINING.....	28
5.5 GENERAL PRECAUTIONS	29
5.6 TRANSFER OPERATIONS.....	30
5.7 MOVEMENT OF CONTAINERS.....	30
5.8 CONNECTING AND MANIFOLDING CONTAINERS	30
5.9 INSPECTION OF PLANT AND EQUIPMENT	31

	<i>Page</i>
5.10 SAFETY PROCEDURES FOR CONSTRUCTION AND MAINTENANCE WORK.....	32
5.11 PERSONAL PROTECTIVE EQUIPMENT.....	33
5.12 FIRST AID	34
 SECTION 6 EMERGENCY MANAGEMENT	
6.1 SCOPE OF SECTION	35
6.2 PLANNING FOR EMERGENCIES	35
6.3 MANIFEST	36
6.4 PLACARDING.....	37
6.5 MANAGEMENT OF LEAKS	37
 SECTION 7 FIRE PROTECTION	
7.1 SCOPE OF SECTION	38
7.2 GENERAL CONSIDERATIONS	38
7.3 FIRE PROTECTION MEASURES	38
7.4 WATER SUPPLY AND FIRE WATER RETENTION	40
7.5 FIRE PROTECTION REQUIREMENTS	40
7.6 ACTION IN THE EVENT OF FIRE	40
 SECTION 8 DISPOSAL OF CHLORINE CONTAINERS AND CONTAMINATED EQUIPMENT	
	40
 APPENDICES	
A PHYSICAL AND CHEMICAL DATA FOR CHLORINE	42
B HAZARDS ASSOCIATED WITH THE STORAGE AND HANDLING OF CHLORINE	48
C REFERENCED DOCUMENTS.....	49
D SAFETY SIGNS AND EMERGENCY INFORMATION PLACARD FOR CHLORINE INSTALLATIONS.....	53
E MATERIALS SUITABLE FOR USE WITH CHLORINE	55
F EXPANSION CHAMBER.....	57
G RECOMMENDATIONS ON THE USE OF FOG NOZZLES AND SPRINKLERS ..	59
H CAUSTIC SODA VENTING SYSTEM	60
I PHYSIOLOGICAL EFFECTS AND FIRST AID PROCEDURES.....	61
J EMERGENCY PROCEDURES FOR LEAKS, SPILLS AND FIRE	63
K BIBLIOGRAPHY OF DOCUMENTS PROVIDING GUIDELINES ON THE PREPARATION OF EMERGENCY PLANS.....	65
L INFORMATION TO BE PROVIDED TO EMERGENCY SERVICES	66
M FIRE PROTECTION	67

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
The storage and handling of liquefied chlorine gas

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements and recommendations for the safe storage and handling of liquefied chlorine gas. It also provides requirements and recommendations for vaporisers, chlorinators and other parts of systems in which chlorine is reticulated and distributed.

NOTES:

- 1 Physical and chemical data for chlorine is provided in Appendix A.
- 2 The hazardous properties of chlorine are discussed in Appendix B.

For the purposes of this Standard, quantities are expressed in kilograms (kg).

1.2 APPLICATION

The requirements of this Standard apply in conjunction with, but do not take precedence over, any government regulations that apply in any area.

NOTES:

- 1 In Australia, chlorine is classified as a workplace hazardous substance by NOHSC: 1008 and listed in NOHSC: 10005. As such, it is subject to the legislative requirements relating to workplace hazardous substances.
- 2 An installation may come under the regulatory control of several authorities, and approval from one does not necessarily constitute an approval from the others.
- 3 The relevant requirements of the *Building Code of Australia (BCA)/New Zealand Building Code (NZBC)* apply to all matters relating to building works.

This Standard does not apply to—

- (a) the manufacture of chlorine gas;
- (b) the chlorination of swimming pools by means of powders or liquids, e.g. calcium hypochlorite, isocyanurates or sodium hypochlorite solution.
- (c) the transport of liquefied chlorine gas, which is covered by other rules and codes, e.g. the ADG Code/NZS 5433;
- (d) the handling and transport of chlorine in port areas which, in Australia, is covered by AS 3846; or
- (e) the end use of chlorine gas.

1.3 REFERENCED DOCUMENTS

A list of documents referred to in this Standard is provided in Appendix C.