

Australian Standard[®]

Cylinders for dissolved acetylene



This Australian Standard® was prepared by Committee ME-002, Gas Cylinders. It was approved on behalf of the Council of Standards Australia on 4 September 2006. This Standard was published on 27 September 2006.

The following are represented on Committee ME-002:

- Air Conditioning and Refrigeration Wholesalers Association
 - Australasian Institute of Engineer Surveyors
 - Australian Chamber of Commerce and Industry
 - The Australian Gas Association
 - Australian Liquefied Petroleum Gas Association
 - Certification Bodies (Australia)
 - Department for Administrative and Information Services, S.A.
 - Fire Protection Association of Australia
 - Institute of Materials Engineering Australasia
 - Pressure Equipment Associated Incorporated
 - Victorian WorkCover Authority
 - Welding Technology Institute of Australia
 - WorkCover New South Wales
-

This Standard was issued in draft form for comment as DR 06249.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that 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Standards may also be withdrawn.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 that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard[®]

Cylinders for dissolved acetylene

Originated as AS B189—1962.
Previous edition AS 2527—1997.
Third edition 2006.

COPYRIGHT

© Standards Australia

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.

Published by Standards Australia, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 7751 1

PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee ME-002, Gas Cylinders to supersede AS 2527—1997, *Cylinders for dissolved acetylene*. After consultation with stakeholders from both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

The objective of this revision is to align the shell specifications with current world practice, allowing a range of seamless steel and welded steel shells made to ISO and other recognized international Standards.

Cylinder design details are provided by reference to Australian and acceptable international Standards that give details of materials, design and manufacturing test regimes.

This Standard also sets out requirements for the porous filler and the solvent together with the cylinder markings.

This Standard allows seamless-steel cylinders as well as welded steel cylinders as suitable shells for acetylene gas use. Obsolete cylinder standards listed as shell specifications in the previous edition have been deleted.

This Standard takes into account ISO 3807, *Dissolved acetylene cylinders—Basic requirements*; the main deviation from that Standard being the inclusion of the simulated external fire test.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

CONTENTS

	<i>Page</i>
1 SCOPE	4
2 REFERENCED DOCUMENTS	4
3 DEFINITIONS	4
4 CYLINDER SHELL	4
5 POROUS FILLER	5
6 SOLVENT	5
7 TYPE TESTS	6
8 RECORD OF DATA	6
9 MARKING	7

APPENDICES

A LIST OF REFERENCED DOCUMENTS	8
B SELECTION AND NUMBERS OF CYLINDERS FOR TESTING	9
C ULLAGE TEST AT ELEVATED TEMPERATURES	10
D PERFORMANCE UNDER BACKFIRE	11
E PERFORMANCE UNDER SIMULATED EXTERNAL FIRE CONDITION	15
F METHOD FOR DETERMINATION OF POROSITY OF FILLER MATERIAL	18

STANDARDS AUSTRALIA

Australian Standard
Cylinders for dissolved acetylene**1 SCOPE**

This Standard specifies the basic requirements for steel cylinders of 5 kg to 160 kg water capacity intended for the storage and transport of dissolved acetylene. Requirements for the porous filler, the solvent, and the cylinder marking are also specified.

NOTE: AS 2030.2 specifies requirements for the filling, inspection and maintenance of cylinders for compressed acetylene dissolved in a solvent.

2 REFERENCED DOCUMENTS

A list with the titles of the documents referred to in this Standard is given in Appendix A.

3 DEFINITIONS

For the purposes of this Standard, the definitions in AS 2030.1 and the following definitions apply:

3.1 Cylinder manufacturer

The organization that produced the completed, but not necessarily charged, acetylene cylinder.

3.2 Dissolved acetylene cylinder

A cylinder and a valve, with safety devices, containing a porous filler, and a solvent for the storage of dissolved acetylene.

3.3 Maximum acetylene charge

The mass of acetylene nominated by the acetylene cylinder manufacturer as being that which may be charged into the cylinder exclusive of the mass of dissolved acetylene to saturate the solvent at atmospheric pressure and at 15°C.

3.4 Tare mass

The combined mass of the cylinder, the valve, well packing, safety devices, the porous filler, the solvent, the dissolved acetylene sufficient to saturate the solvent at atmospheric pressure and at 15°C, and any valve protection features that are permanently attached directly to the cylinder.

4 CYLINDER SHELL**4.1 Shell specification**

The cylinder shell shall be of steel, and shall be manufactured in accordance with one of the following Standards, but the cylinder markings shall be in accordance with this Standard:

- (a) AS 2469.
- (b) AS 2470.
- (c) AS 2875.
- (d) ISO 4706.

- (e) DOT 8.
- (f) DOT 8AL.
- (g) TC – 8WM.
- (h) TC – 8WAM.
- (i) ISO 9809-1.
- (j) ISO 9809-2.
- (k) ISO 9809-3.
- (l) EN 1975.

4.2 Test pressure

The design test pressure shall be not less than 5.2 MPa.

4.3 Fitment of safety device

4.3.1 General

Where safety devices are fitted, they shall be fusible plugs, Type FP2, in accordance with AS 2613.

4.3.2 Location

Both welded and seamless acetylene cylinders shall have one or more fusible plug devices fitted either to the valve end of the cylinder or to the cylinder valve. It should be noted that some seamless cylinder shell specifications will allow fitment of the safety device to the cylinder valve only.

4.3.3 Number and size

The number and size of the fusible plugs shall be such that the performance requirements of Clause 7.4 of this Standard are achieved.

5 POROUS FILLER

5.1 Properties

The porous filler shall be monolithic and shall not disintegrate or sag when wet with solvent or when subjected to normal service. The porous filling materials shall be uniform in quality and free of voids, except that a well drilled into the filling material beneath the valve is allowable if the well is filled with a material of such a type that the functions of the filling material are not impaired. These properties or any other properties shall be such so as not to impair the dissolved acetylene cylinder to pass the type test described in Clause 7.3.

5.2 Compatibility

There shall be no deleterious reaction between the porous filler and acetylene, the solvent, or any part in contact with the cylinder shell.

5.3 Clearance

The maximum clearance between porous filler and the end of the cylinder, due to shrinkage of the porous filler and other factors, shall not be greater than 3.5 mm or 0.5 percent of the internal length of the cylinder, whichever is the least.

6 SOLVENT

The quantity and type of solvent shall be such as will enable the completed cylinder to pass the type tests specified in Clause 7, and shall be nominated by the cylinder manufacturer.

The solvent type shall be specified by the cylinder manufacturer.

7 TYPE TESTS

7.1 Type testing

Cylinders subject to type testing shall have porous filler characteristics, quantity and type of solvent, and mass of acetylene in accordance with the schedule provided by the manufacturer. Details on the selection and number of cylinders for testing is given in Appendix B.

NOTE: Testing should be performed by trained personnel at a suitable specially designed test site to accommodate the possibility that the cylinder may explode.

7.2 Ullage test (at elevated temperature)

When tested in accordance with Appendix C, the pressure in the cylinder shall not exceed 5.2 MPa, and ullage space shall remain, i.e. hydraulic pressure shall not develop, as indicated by the shape of the pressure curve.

NOTE: This test is named the 'elevated temperature test' in ISO 3807.

7.3 Performance under backfire

When tested in accordance with Appendix D, the cylinder shall withstand and contain the internal decomposition.

7.4 Performance under simulated external fire condition

When tested in accordance with the regime detailed in Appendix E, the performance shall be as follows:

- (a) The fusible plug(s) shall release and the contents of the cylinder shall fully discharge without violent rupture of the cylinder.
- (b) A localized split shall not be taken to be violent rupture.
- (c) The cylinder's falling off the base or tipping over due to a localized split or to release of a fusible plug shall not be a basis for rejecting a test.

NOTES:

- 1 The performance under this test is not to be taken as an indication of the fire-resisting properties of the charged cylinder.
- 2 Assessment of extensive penetration is a matter for expert judgement.

8 RECORD OF DATA

A record giving the following information relative to each cylinder shall be provided:

- (a) Water capacity, to the nearest 0.1 kg, of each cylinder.
- (b) Mass, to the nearest 0.1 kg, of each cylinder when empty and dry, including fusible plugs, necking and footring, if any, and any part permanently attached to the cylinder but not including valve or cap.
- (c) Mass, to the nearest 0.1 kg, of each cylinder in Item (b) plus mass of porous filling.
- (d) Tare mass, to the nearest 0.1 kg.
- (e) Maximum mass of acetylene to be charged into the cylinder, exclusive of the mass of dissolved acetylene necessary to saturate the solvent at atmospheric pressure and 15°C.
- (f) Identification of porous filler and nominated range of porosity (expressed as a percentage) of the filler material. Appendix F sets out a method for determination of porosity of the filler material.

NOTE: The symbol LS is used to identify lime silica (calcium silicate) porous filler.

- (g) Number of specification to which cylinder was manufactured.