Australian Standard®

The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases

Part 4: Welded cylinders — Insulated

This Australian standard was prepared by Committee ME/2, Gas Cylinders. It was approved on behalf of the Council of the Standards Association of Australia on 28 November 1984 and published on 31 January 1985.

The following interests are represented on Committee ME/2:

Aluminium Development Council
Australasian Steamship Owners Federation
Australian Chamber of Commerce
Australian Liquefied Petroleum Gas Association
Australian Underwater Federation
Australian Welding Institute
Board of Fire Commissioners, N.S.W.
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PREFACE

This standard was prepared by the Association's Committee on Gas Cylinders.

Cylinders for cryogenic fluids have been in use in Australia for many years, for various specialized applications. The advantage of a greatly increased ratio of gas contents to cylinder mass available through cryogenics has led to a substantial growth in use of these cylinders. There is also greater use of cryogenic fluids for engineering, food processing, and biological application.

It is therefore considered essential that cylinders for cryogenic fluids be specified within AS 2030, SAA Gas Cylinders Code.

The (U.S.) Department of Transportation specification 4L (DOT 4L) is the only national standard for an insulated welded cylinder.

This standard refers to DOT 4L, and use has also been made of a document Minnesota Valley Engineering Operating Instructions and Safe Handling for Model VGL-160L vessels.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

THE VERIFICATION, FILLING, INSPECTION, TESTING AND MAINTENANCE OF CYLINDERS FOR STORAGE AND TRANSPORT OF COMPRESSED GASES

PART 4: WELDED CYLINDERS—INSULATED

1 SCOPE. This standard sets out requirements for markings, filling procedures, inspecting and testing, fittings and safe handling of gas cylinders incorporating an insulated stainless steel inner vessel, used for the storage and transport of fluids including those listed in Table 1, and of water capacity not less than 0.1 kg and not greater than 500 kg.

NOTES:

1. The standard is particularly directed to use of cylinders complying with (U.S.) Department of Transportation Specification 4L.
2. The requirements specified for cylinder contents traffic change do not provide for medical gases.
3. AS 1894 provides requirements for the safe handling of cryogenic fluids.

TABLE 1

CONTENTS AND CYLINDER DESIGN SERVICE TEMPERATURES

Contents (See Note 1)		Cylinder design service temperature (See Note 2) °C (°F)
Name	Symbol	
Argon	Ar	−196 (−320) or colder
Carbon dioxide	CO_2	−196 (−320) or colder
Helium	He	−269 (−452) or colder
Hydrogen	H_2	−242 (−423) or colder
Methane	CH_4	−196 (−320) or colder
Liquefied natural gas	(NLG)	−196 (−320) or colder
Nitrogen	N_2	−196 (−320) or colder
Nitrous oxide	N_2O	−196 (−320) or colder
Oxygen	O_2	−196 (−320) or colder

NOTES:

1. Other contents as appropriate are permitted in accordance with AS 2030, Part 1.
2. Owing to the U.S. origin of the DOT 4L specification, design service temperatures are commonly expressed in degrees Fahrenheit.

2 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1894 Code of Practice for the Safe Handling of Cryogenic Fluids

AS 1942 Refrigerant Gas Cylinder Identification

AS 1943 Industrial Gas Cylinder Identification

AS 1944 Medical Gas Cylinder Identification

AS 2030 SAA Gas Cylinders Code
Part 1—Cylinders for Compressed Gases Other than Acetylene*

AS 2337 Gas Cylinder Test Stations*

AS 2473 Valves for Compressed Gas Cylinders (Threaded Outlet)

SAA MP 48 Approved Gas Cylinder Test Stations

ANSI B57.1)
—1977)Compressed Gas Cylinder Valve Outlet
CGA V—1)and Inlet Connections
CSA B96)

U.S. Department of Transportation Specification 4L, Welded Cylinders Insulated (see Code of Federal Regulation–49).

3 DEFINITIONS. For the purpose of this standard the definitions given in AS 2030, Part 1, apply.

4 MARKINGS AND IDENTIFICATION.

4.1 Contents Identification Band. The cylinder shall have a coloured band around the entire circumference and within the one-third of the body nearest the neck. For a 160 kg or larger water capacity cylinder, the band shall be not less than 75 mm wide. The colour of the band shall be in accordance with the cylinder body colour specified for the particular contents in AS 1942, AS 1943 or AS 1944, as appropriate.

4.2 Contents Identification Label. The cylinder shall have a label affixed in a readily observable location to identify the contents by name. The label shall be not less than 200 mm long and 100 mm wide, and shall have black lettering on a white background.

The lettering shall be 'Liquid . . . . . .
(name of contents) . . . . . '.

4.3 Cylinder Colour. The cylinder surface other than that carrying the contents identification band shall be of such colour as will minimize radiant heat transfer.

4.4 Cautionary Advice. The cylinder shall have a label affixed in a readily observable location to give cautionary advice on the safe handling of the cylinder with the contents. The label shall be not less than 225 mm long and 150 mm wide.

4.5 Cylinder Stampings. Cylinder stampings applied subsequent to manufacture shall not be applied to the vacuum-retaining sections of the cylinder and shall only be applied to a permanent attachment. The stampings shall include all of the following:

(a) DOT 4L, followed by the service pressure.

NOTE: The unit of service pressure as applied by a U.S. manufacturer will normally be the pound per square inch (gauge).

(b) For cylinders intended for use at a service temperature colder than minus 196°C (minus 320°F) only, the mark 'ST' followed by the intended service temperature, in degrees Celsius or degrees Fahrenheit as appropriate to the country of stamping, and marked 'C' or 'F' as appropriate.

NOTE: The unit of temperature as applied by a U.S manufacturer will normally be the degree Fahrenheit.

* In course of revision.

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