AS 2705—1984
UDC 621.642.02:626.025.5

Australian Standard 2705—1984

PORTABLE CYLINDERS FOR SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA)—SAFETY GUIDE

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

C

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 6 February 1984 and published on 6 April 1984.

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 of New South Wales

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Department of Employment and Labour Relations, Qld

Department of Industrial Relations, N.S.W.

Department of Labour, S.A.

Department of Labour and Industry, Tas.

Department of Labour and Industry, Vic.

Department of Labour and Industry, W.A.

Department of Mines, Qld

Department of Mines and Energy, N.T.

Department of Territories and Local Government

Insurance Council of Australia Ltd

Railways of Australia Committee

This standard was issued in draft form for comment as DR 80168.

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

AMENDMENT No 1
to
AS 2705—1984
PORTABLE CYLINDERS FOR SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA) —SAFETY GUIDE

DELETIONS

SUMMARY: This amendment applies to Appendix A.

Published on 5 October 1984.

Page 10. APPENDIX A.

AMDT No 1 OCT. 1984

Delete following entries in list.

AS	Fibreglass Reinforced Plastics (FRP)
	Aluminium Alloy Gas Cylinders—Hoop Wrapped*
HOLASS 1	Lightweight Alloy Seamless Steel Containers†
HOLASW 1	Lightweight Alloy Steel Containers†

Delete footnote *In course of preparation.

AUSTRALIAN STANDARD

PORTABLE CYLINDERS FOR SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA)—SAFETY GUIDE

AS 2705—1984

First published (as Supplement No 3 to AS CB4) 1974
AS 2705 first published 1984

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 3359 5

PREFACE

This standard was prepared by the Association's Committee on Gas Cylinders. It supersedes Supplement No 3 (1974) to AS CB4, the former SAA Gas Cylinders Code, now superseded by AS 2030.

The use of privately owned breathing apparatus brings compressed gas cylinders into the hands of people not familiar with the risks involved and the care required. Inspecting authorities with responsibility in relation to pressure vessels, and many other governmental and private organizations, consider it desirable that recommendations drawing attention both to the dangers associated with compressed gas cylinders and to practices which will serve to minimize these dangers be available for guidance.

The publication of this standard setting out the dangers involved and the precautions to be observed is the result of one line of action. A second line involves the introduction of regulations covering appropriate features of the use and filling of cylinders.

Through the SAA Gas Cylinders Code (AS 2030) and related specifications for cylinders, Committee ME/2 has established standards of safety recognized by the industry. These standards are enforced by the compressed gas industry itself, and by relevant inspecting authorities.

Private persons and organizations considering using cylinders as part of underwater breathing apparatus may not be familiar with these national standards; however, for their own safety they should seek guidance in regard to acceptable practice. Furthermore, filling of cylinders with air is sometimes carried out by firms or diving groups other than the normal fillers of gas cylinders, and these firms or groups should seek guidance on the standard precautions to be observed.

While the SAA Gas Cylinders Code covers general requirements for the safe use of all types of gas cylinder, it does not cover some of the particular problems that arise through the handling of cylinders by private persons under the special conditions presented by underwater breathing apparatus. The purpose of this standard is to provide such guidance for the safe use of underwater breathing cylinders.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
PORTABLE CYLINDERS FOR SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA)—SAFETY GUIDE

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard provides guidance on safe practices for gas cylinders for self-contained underwater breathing apparatus (SCUBA) where the breathing gas is compressed air.

NOTES:

1. Special requirements apply to use of underwater breathing gas with more than 22 percent oxygen, which are beyond the scope of this standard.
2. AS 2299 covers safety and health of divers engaged in professional and/or commercial underwater operations, but many of the requirements of that standard are applicable to sports and similar diving operations.
3. AS 2704 provides for gas cylinders for self-contained breathing apparatus other than for underwater use.

1.2 REFERENCED DOCUMENTS. In addition to the cylinder specifications listed in Appendix A, the following documents are referred to in this standard:

AS 1349	Bourdon Tube Pressure and Vacuum Gauges
AS 1944	Medical Gas Cylinder Identification
AS 2030	SAA Gas Cylinders Code Part 1—Cylinders for Compressed Gases Other than Acetylene
AS 2299	Underwater Air Breathing Operations
AS 2337	Gas Cylinder Test Stations
AS 2568	Purity of Compressed Medical Breathing Air
AS 2704	Portable Cylinders for Resuscitators and Self-contained Breathing Apparatus (Non-underwater)—Safety Guide
SAA MP48	Approved Gas Cylinder Test Stations.

1.3 DANGERS ASSOCIATION WITH SCUBA CYLINDERS.

1.3.1 Explosion. The main danger with a compressed air cylinder is that when filled the cylinder contains considerable energy. Misuse can result in an explosion causing serious damage, and injury or death of persons nearby.

Explosion of a filled cylinder might be caused by one or more of the following:

(a) Weakening of the cylinder wall or ends due to internal or external corrosion, abrasive wear, or other defect.

(b) Reaction between oxygen present in the contained air and contaminating oil or other hydrocarbon vapour, resulting in a rapid and large increase of internal pressure.

(c) Application of internal pressure in excess of the pressure for which the cylinder was designed, i.e. due to overfilling.

(d) Application of heavy, sudden, or concentrated loads.

(e) Application of heat resulting in an increase of internal pressure above that for which the filled cylinder was designed, or in loss of mechanical strength of the cylinder wall.

1.3.2 Other dangers. Other dangers associated with the use of a compressed air cylinder include the following:

(a) Leakage of the contents, resulting in the apparatus being useless or giving an insufficient supply of air for the intended application.

(b) Particles of rust or scale blocking air passages in the apparatus.

(c) The presence of water which can cause icing (and possible blockage) of reducing valves.

(d) Polluted or incorrect cylinder contents.

1.4 PRECAUTIONS IN THE USE OF CYLINDERS. The following general precautions are to be observed in the use of a cylinder:

(a) Handle with care. Do not drop on hard surfaces, throw about, strike, or use as rollers. Take care not to damage the valve.

(b) Keep filled cylinder cool and where practicable away from solar and thermal radiation.

(c) Ensure moisture does not enter, either with the filling gas, or through an open valve of the emptied cylinder. Fill with dry gas only. Except during inspection or maintenance, the internal pressure is never to be permitted to fall to atmospheric pressure, i.e. a residual pressure of charge gas is to be retained. Fit a plug where a valve is not fitted.

(d) Ensure lubricants comply with the recommendations of the manufacturer of the breathing apparatus, and the manufacturer of the valve.

(e) Never use a cylinder with a damaged or suspect valve. Have a leaking valve repaired or replaced.

NOTE: A leaking valve can be detected when fitted to a filled or partially filled cylinder by holding the valve under water, or by brushing on a soapy solution. A leak at a valve spindle can be detected by connecting the cylinder to the breathing apparatus and repeating the above check with the valve spindle in the open position, but thoroughly dry the valve after such a check. It is recommended that only trained persons remove a valve, and a damaged or excessively stiff valve is to be referred to persons competent to repair the valve.

(f) Do not tamper with any safety device.

(g) Do not cover or alter any cylinder markings. Stampings are only to be applied by a gas cylinder test station approved for testing of seamless gas cylinders.

NOTE: SAA MP48 lists SAA approved gas cylinder test stations.