Superseded by AS 1777-1995

Under Revision See DR 94139

AS 1777—1989

Australian Standard®

Aluminium cylinders for compressed gases—Seamless—0.1 kg to 130 kg

E

This Australian Standard was prepared by Committee ME/2, Gas Cylinder. It was approved on behalf of the Council of Standards Australia on 11 September 1989 and published on 11 December 1989.

The following interests are represented on Committee ME/2:

ACT Administration—Office of City Management
Aluminium Development Council
Australian Assembly of Fire Authorities
Australian Chamber of Commerce
Australian Liquefied Petroleum Gas Association Ltd
Australian Underwater Federation
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Department of Defence
Department of Industrial Affairs, Qld
Department of Industrial Relations and Employment, N.S.W.
Department of Labour, S.A.
Department of Labour, Vic.
Department of Labour and Industry, Tas.
Department of Mines, Qld
Department of Occupational Health, Safety and Welfare, W.A.
Fire Protection Industry Association of Australia
Insurance Council of Australia
Railways of Australia Committee
The Australian Gas Association
Work Health Authority, N.T.

AS 1777—1989

Australian Standard®

Aluminium cylinders for compressed gases—Seamless—0.1 kg to 130 kg

First published as AS 1777—1975.
Second edition 1984.
Third edition 1989.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY NSW
ISBN 0 7262 5926 8

PREFACE

This edition of this Standard was prepared by the Standards Australia Committee on Gas Cylinders to supersede AS 1777—1984.

This edition introduces, together with several editorial changes, the introduction of aluminium alloy designation 6061 and the reduction of lead content from 0.01 percent to 0.003 percent.

The alloy 6061 has been included to align with the trend shown in Europe, America and Japan. The lead content has been lowered after six years of lead analysis in Australia has shown no cast in excess of 30 ppm.

CONTENTS

STANDARDS AUSTRALIA

Australian Standard

Aluminium cylinders for compressed gases—Seamless—0.1 kg to 130 kg

1 SCOPE. This Standard specifies requirements for seamless aluminium cylinders having a water capacity exceeding 0.1 kg but not exceeding 130 kg intended for the storage and transport of compressed gases, and designed for a hydrostatic test pressure of not less than 1.75 MPa.

NOTE: Appendix A lists the suggested minimum information that should be supplied by the purchaser when ordering gas cylinders by this Standard.

2 APPLICATION. This Standard applies essentially to the manufacture of gas cylinders, in that it specifies such matters as material, design, heat treatment, inspection during manufacture, and conditions of supply. Further, the tests specified are related to batch compliance 'at works' and provide for retesting and in some circumstances reheat treatment.

Subject to adequate certification with respect to the various manufacturing provisions within this Standard, and the results of batch testing, the Standard may also be used as a basis for the approval and certification of finished cylinders.

3 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS
1391 Methods for tensile testing of metals
1733 Methods for the determination of grain size in metals
1866 Aluminium and aluminium alloys—Extruded rod, bar, solid and hollow shapes
2030 SAA Gas Cylinders Code
2030.1 Part 1: Cylinders for compressed gases other than acetylene*
2337 Gas cylinder test stations*
2337.1 Part 1: General requirements, inspections and tests—Gas cylinders
2473 Valves for compressed gas cylinders (threaded outlet)
2613 Safety devices for gas cylinders
B133 Unified screw threads
Parts 1 and 2: Diameters ¼in and larger

ANSI
B57.1—1977 Compressed gas cylinder valve outlet and inlet connections*
CGA V-1 Compressed gas cylinder valve outlet and inlet connections*
CSA B96 Compressed gas cylinder valve outlet and inlet connections*
BS 5045 Transportable gas containers
Part 1: Specification for seamless steel gas containers above 0.5 litre water capacity

4 DEFINITIONS. For the purpose of this Standard, the definitions given in AS 2030.1, and those below apply.

4.1 Inspecting authority—an authority with statutory power to control the design, construction and certification of cylinders for the Commonwealth of Australia or relevant State or Territory.

4.2 Inspector—a person, acceptable to the Inspecting Authority, who ensures and certifies that all the inspections specified herein have been carried out and that the cylinders comply with all the requirements of this Standard.

5 ALUMINIUM ALLOY.

5.1 Chemical composition. The chemical composition shall be in accordance with AS 1866 for aluminium alloy designation 6351 or designation 6061, except that the maximum lead content shall be 0.003 percent.

A chemical analysis for lead shall be made of the last 10 percent of each drop. Additional chemical analysis, of other parts of each drop, may also be made. Any non-compliance of the chemical analysis for lead shall be cause for rejection of the represented drop.

NOTE: A drop is taken to mean a pour of metal in one operation to result in one casting operation.

5.2 Tensile properties (from cylinder). The tensile properties of the cylinder material, determined in accordance with Clause 9.1.2 subsequent to the heat treatment and prior to hydrostatic pressure testing, shall be in accordance with the following:

(a) 0.2 percent proof stress ..... 280 MPa min.
(b) Tensile strength ..... 320 MPa min.
(c) Elongation ..... 12 percent min.

5.3 Freedom from defects. Each billet shall be ultrasonically tested to ensure there is no piping, shrinkage cavity, seams, cracks, laminations, segregation, or other physical defect which could cause defective cylinders.

Ultrasonic testing of the billet shall include two scans for the length of the billet, from scanning axes perpendicular to the length of the billet and 90 degrees displaced from each other. The maximum defect response shall be not greater than that caused by a 2.0 mm diameter flat-bottomed hole drilled into a calibration block of the same chemical composition. The appropriate depth of the hole depends on the billet diameter and should be established from experience.

NOTES:

1. A sound source frequency of either 4 MHz or 6 MHz is recommended.
2. The successful application of ultrasonic testing depends upon the technical competence of the testing personnel and on their ability to interpret test results. It is essential that testing personnel be conversant with the test equipment and be capable of demonstrating to the satisfaction of interested parties their technical competence and interpretive ability.

   The Australian Institute for Non-destructive Testing (AINDT) operates a qualification scheme with respect to a person's general knowledge of a non-destructive testing method. These AINDT qualifications are recognized by the National Association of Testing Authorities, Australia (NATA), which operates an accreditation scheme for non-destructive testing services.

* Published as one document.