AS 2971—2007
Reconfirmed 2017

AS 2971—2007

Australian Standard®

Serially produced pressure vessels

This Australian Standard® was prepared by Committee ME-001, Pressure Equipment. It was approved on behalf of the Council of Standards Australia on 26 April 2007.
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- Australian Aluminium Council
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- Materials Australia
- National Association of Testing Authorities, Australia
- Pressure Equipment Association
- Victorian WorkCover Authority
- Welding Technology Institute of Australia
- WorkCover NSW

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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 the public comment period.

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STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2971—2007
Serially produced pressure vessels

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Technical Committee ME-001 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 01 May 2017.

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NOTES

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee ME-001, Pressure Equipment to supersede AS 2971—2002, *Serially produced pressure vessels.* After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard covers a wide range of small, usually low-hazard, pressure vessels whose design and construction are based on satisfactory burst and other performance tests of a significant number of representative samples. The main types of vessels falling into this group are small, serially produced refrigeration type vessels, air brake reservoirs, drink dispensers, and consumer items such as pressurized fire extinguisher bodies not covered by other Australian Standards, and beer kegs.

Almost invariably these types of vessels do not comply with AS 1210, *Pressure vessels,* which has been prepared primarily for one-off vessels where the design is based on proven formulas, and construction is based on proven materials, fabrication procedures, personnel, and tests which are predominantly non-destructive. AS 1210 does permit burst testing as a basis for acceptance of design of parts or vessels, but only when they cannot be calculated. Thus, there is a need to cover this alternative method of producing safe vessels where it is frequently equally sound and more economic to use burst and other performance tests to validate design, materials, and fabrication, all simultaneously.

The main changes in this revision include the following:

(a) Clause 1.1, Scope—The lower limit for the temperature range has been changed from –20°C to –30°C, to better meet the needs of the refrigeration industry.

(b) Clause 1.5.1, Batch—The time period considered to constitute a 'batch' has been widened from 5 days to 3 months, as the previous test regime was thought to be unnecessarily onerous.

(c) Clause 1.5.14, Unfired pressure vessel—The definition of the pressure envelope has been clarified in line with AS 1210—1997.

(d) Section 3, Performance requirements—The test requirements for designs using 'suitably ductile' materials have been substantially altered.

(e) Clause 5.2, Type testing—Allowance for testing of a 'representative' vessel or design where there is a family of designs which varies only in length and connections.

(f) Table 5.1, Schedule for assessment of performance characteristics—The number of vessels between tests for burst and fragmentation requirements has been increased from 500 to 1000.

(g) Appendix D, Burst and fragmentation test—The known performance of materials operating outside the range of 0 to 50°C is now taken into account in tests and design strengths.

(h) Appendix I, Corrosion tests—The brass cracking test method has been replaced to avoid the safety risks involved with the use of mercurous nitrate.

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

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the materials, design, manufacture, inspection and testing of serially produced metallic or non-metallic or combination unfired pressure vessels comprising:

(a) A maximum volume of 500 L.

(b) A design pressure exceeding 0.05 MPa.

(c) A product of the design pressure (in megapascals) and the total vapour space (in litres) that is greater than 1 but less than 3000 MPa.L. Where the vessel contents are classified as harmful or very harmful to AS 4343, the upper limit is 1500 MPa.L. This Standard excludes contents classified as lethal.

NOTE: The vapour space is the maximum volume which will contain compressed gas or vapour or liquefied gas or liquid above its atmospheric boiling point.

(d) A temperature range of –30°C to 150°C. Vessels designated outside the range of 0°C to 50°C require special tests. Refer to Appendices D, F and G where applicable.

Such vessels may be refillable or non-refillable.

NOTE: Users of this Standard are reminded that it has no legal authority in its own right, but may acquire legal standing if adopted by government or any other authority having jurisdiction, or if specified as part of a commercial contract.

1.2 OBJECTIVE

This Standard is intended to —

(a) establish minimum requirements for the materials, design, manufacture, inspection and testing for pressure vessels within the range of Clause 1.1; and

(b) provide a method of design based on destructive type testing and monitoring of manufacture by performance testing of representative samples from production. This method is an alternative to that given in AS 1210 to vessels within the range of Clause 1.1.

1.3 APPLICATION

This Standard is not intended to apply to —

(a) pressure vessels covered by other Australian Standards, e.g. portable fire extinguishers, LP Gas fuel vessels for automotive use and sterilizers;

(b) compressed gas cylinders covered by AS 2030 (series);

(c) glass and plastics bottles; or

(d) vacuum vessels (i.e. vessels that operate only below atmospheric pressure).