AS 1210—2010
(Incorporating Amendment Nos 1 and 2)

AS 1210—2010

Pressure vessels

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- National Association of Testing Authorities, Australia
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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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Australian Standard®

Pressure vessels

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PREFACE

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee ME-001, Pressure Equipment, to supersede AS 1210—1997, *Pressure vessels*, AS 1210 Supplement 1—1990 and AS 1210 Supplement 2—1999. This Standard is referenced in AS/NZS 1200, which is the parent Standard for pressure equipment and outlines general requirements for boilers, pressure vessels, pressure piping and related matters.

This Standard incorporates Amendment No. 1 (November 2013) and Amendment No. 2 (July 2015). The changes required by the Amendments are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The issues discussed in Rulings RUL PE.3, RUL PE.4 and RUL PE.9 to PE.14 have been addressed in this revision, and those rulings will be withdrawn.

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 Australia/New Zealand Standard.

The main changes in this edition are as follows:

(a) Incorporation of Amendments 1 to 3 to AS 1210—1997.

(b) Incorporation and review of Supplement 1 to AS 1210—1997 as Appendix H (on stress classification and limits), Appendix I (on finite element analysis) and Appendix M (on design against fatigue).

(c) Incorporation and review of Supplement 2 to AS 1210—1997 as Appendix L (on cold-stretched vessels).

(d) Revision of requirements for low temperature service, mainly in Clause 2.6.

(e) Revision of design tensile strength Table B1 (previously Table 3.3.1).

(f) Revision of Appendix A on design tensile strengths to align more closely with international practice.

(g) Revision of application of safety factors for flanges and transportable vessels.

(h) Deletion of the 400 mm manhole size from Table 3.20.9.

(i) Revision of Appendix E on information to be supplied to the designer.

(j) New Appendix G on failure modes.

(k) New Appendix J on wind and seismic loadings.

(l) New Appendix N on local non-pressure loads.

Minor changes have been made in the welding procedure, test plate, and postweld heat treatment requirements, principally to align with world practice. It is not intended that welding procedures already qualified will be invalidated by these changes or that the changes be applied retrospectively.

Amendment No. 2 to the 1997 edition reduced the factor of safety used to determine the material design stress from 4 to 3.5. This change is now confirmed in the Standard. The justifications for such a change included improvement in the quality of materials, improvement in the quality of welding and fabrication, improved inspection technology and better information on design, operation, maintenance and vessel failures.

Where other Standards refer to Supplements 1 and 2 to AS 1210—1997, this should now be taken as referring to this edition of AS 1210.

Statements expressed in mandatory terms in notes to tables and figures 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 Appendices. A ‘normative’ appendix is an integral part of this Standard and an ‘informative’ appendix is only for information and guidance.

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FOREWORD

Design, manufacturing and supply requirements: The requirements in this Standard are intended to provide reasonably certain protection of life and property, and to indicate where a margin for deterioration in service may be needed to give reasonably long, safe equipment life. The Standard takes into consideration advancements in design and materials, and the evidence of experience.

The Standard contains basic data necessary for design, including material specification, design parameters, requirements for fabrication, testing and inspection. These requirements are specified in terms of principles where possible, with further detail added for uniform interpretation of principles and guidance on best methods. In other areas the Standard indicates where caution is necessary but a direct prohibition would be unwise at the present level of local and international knowledge.

In principle this Standard follows other codes forming part of AS/NZS 1200 in giving guidance to designers, manufacturers, inspection bodies, purchasers and users in the form of minimum engineering requirements that are necessary for the safe design, manufacture and testing of pressure vessels. In special instances additional requirements may be necessary for adequate performance or safety.

The Standard classifies vessels based on different classes of construction, and gives basic principles to indicate where such classes should or are to be used. Four classes (1, 2A, 2B, 3) use a stress safety factor of 3.5, and four classes (i.e. 1H, 2H, and 1S and 2S using cold-stretching) use higher design stresses.

No rules for design and manufacture can be written in sufficient detail to ensure good workmanship in manufacture. Each vessel manufacturer is responsible for taking every necessary step to make sure the quality of manufacture is such as will ensure compliance with good engineering practice and design.

The user of pressure vessels will also need to consider many factors beyond those covered by this Standard in the final specification of a vessel and is cautioned that the Standard is not a complete design handbook and there is a need for competent engineering judgement.

Adaption for regulatory change: The Standard continues to be written largely for Australian conditions and to cater for recent moves in various States and Territories to objective or performance regulations rather than the earlier prescriptive ones. These moves also have lead to privatization of inspection functions such as design verification, manufacture and in-service inspection, and agreement by designers, manufacturers, purchasers and others involved.

Thus the Standard uses competent ‘inspection bodies’ (somewhat like ‘notified bodies’ in European practice) in place of the previous regulatory authority and is written as far as practical for clear interpretation and use in contracts to assist all parties and facilitate safety and trade.

Use of alternative methods: In addition to the flexibility provided for the various classes of vessels, provision is made for the use of specific alternative methods, materials, and the like where equivalent safety and performance is achieved and any departures from the Standard are clearly identified in all documentation and are agreed.

Use of international Standards: Acknowledgment is gratefully made to the American Society of Mechanical Engineers for permission to reproduce certain extracts from the *ASME Boiler and Pressure Vessel Code*. In addition, acknowledgment is made of the considerable assistance provided by British and other national Standards, recent EN Standards and the recent draft ISO Standards for pressure vessels. This takes advantage of world experience as well as Australian experience, and helps to align with these major Standards to optimize safety and standardization and facilitate trade.

Compliance with the appropriate class of this Standard will satisfy the technical requirements for equivalent vessels to the above national, regional and international Standards. However, compliance with regulatory and quality requirements of the country of use will need to be satisfied. For comparison of this Standard with the above Standards see AS/NZS 1200.

Effect on existing designs of vessels: The revised and new requirements in this edition of the Standard are not intended to require modifications to any existing vessels that were constructed to previous editions of the Standard. However, there may be cases where implementing the new requirements to an existing design could be advantageous. Existing designs for future vessels should be suitably revised.

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