AS 1548—2008
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Australian Standard®

Fine grained, weldable steel plates for pressure equipment

This Australian Standard® was prepared by Committee ME-001, Pressure Equipment. It was approved on behalf of the Council of Standards Australia on 31 March 2008.
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The following are represented on Committee ME-001:

- ACT Workcover
- Australasian Institute of Engineer Surveyors
- Australian Aluminium Council
- Australian Building Codes Board
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Institute for the Certification of Inspection Personnel
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- Insurance Council of Australia
- LPG Australia
- Materials Australia
- National Association of Testing Authorities
- 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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Australian Standard®

Fine grained, weldable steel plates for pressure equipment

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-001, Pressure Equipment and supersedes AS 1548—1995, *Steel plates for pressure equipment*.

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.

For a summary of the major changes introduced in this edition of the Standard, refer to the Foreword.

The objective of this Standard is to specify requirements for hot-rolled fully killed carbon-manganese steel plates to a maximum thickness of 150 mm for use in the construction of pressure equipment.

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 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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FOREWORD

The following is a summary of the changes from AS 1548—1995:

(a) The '5' and '7' designations have been replaced by 'PT', which partially aligns with the ISO and EN designations. 'P' is for pressure equipment and 'T' is for tensile strength designation as opposed to the yield strength designation used by the ISO and EN Standards. Essentially, the property requirements have not changed from the previous edition.

(b) The 'R' and 'A' designations have been combined into a new normalized rolled 'NR' designation. This aligns the former 'R' and 'A' interchangeability clause with ISO and EN. The definition of normalized rolling aligns with EN 10028 except that the EN Standard allows it be designated as an 'N' grade. It was thought that this would create confusion in the Australian industry and hence the 'NR' designation was formed.

The designation 'NRA' has been added to allow for the ordering of NR grades with simulated normalized test results.

(c) All grades are to be Charpy tested to exhibit some level of toughness, in line with the ISO and EN Standards. The former 'base' grades were expected to meet a certain toughness level in the pressure vessel design Standard AS 1210, based upon the performance of BlueScope Steel's grades but without any explicit requirements in AS 1548.

(d) The Charpy energy values have been changed to align with those expected in AS 1210, and with those in the ISO and EN Standards.

(e) With the removal of the '5' and '7' designations, it was decided to retain the strength requirements of the former 5-490 grade but allow NR and T to be supplied in addition to the original N. This is in line with the ISO and EN Standards.

(f) The elevated temperature tensile test values (in Table 5) have been changed to align with the ISO and EN Standards. They now represent a lower 2 standard deviation yield stress value and are not a pass/fail criteria, but are more like design values. In case of disputes, the minimum acceptable elevated temperature yield strength is set at 5% below the tabulated values. The expected removal of the safety factor penalty for non-tested elevated temperature grades from AS 1210 and AS 1228 may reduce the need for the H grade, but it is retained for purchasers who want a test result.

Elevated temperature tensile strength (R_{mT}) values have not been listed.

(g) A new grade PT540T has been included, up to 40 mm thickness, which takes advantage of the strength levels that can be achieved from thermomechanical controlled rolling. Creep rupture properties for this grade have not been included, as data is not yet available.

(h) A definition of fine grained steels has been included.

(i) Guidance on the effect of excessive stress relieving has been added.

(j) Changes to Appendices C, D and E have been made to accommodate the new designations.

(k) References to continuous mill product have been removed from the standard.

(l) C and CE limits are tighter but well within the capacity of the standard grades.

(m) For grades L20 and below, the allowable Niobium level has increased from 0.025% to 0.030%.

STANDARDS AUSTRALIA

Australian Standard
Fine grained, weldable steel plates for pressure equipment

1 SCOPE

This Standard specifies requirements for hot-rolled, fine grained, fully killed carbon-manganese steel plates to a maximum thickness of 150 mm for use in the construction of pressure equipment.

NOTE: Guidelines to purchasers on requirements that should be specified by the purchaser and those that should be agreed to at the time of enquiry or order, or both, are given in Appendix A.

2 APPLICATION

This edition of AS 1548 supersedes all previous editions of the Standard, however this does not imply that material manufactured to previous editions is now invalid, nor that designs using previous grades are invalidated. It is intended that existing designs, procedures, specifications, materials etc. need not be altered in response to the publication of the new edition of this Standard. The equivalency of current and previous grades of steel to AS 1548, and the application of current grades to existing designs, specifications, procedures, etc. is described in Appendix B.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard.

AS	
1210	Pressure vessels
1391	Metallic materials—Tensile testing at ambient temperature
1544	Methods for impact tests on metals
1544.2	Part 2: Charpy V-notch
1710	Non-destructive testing—Ultrasonic testing of carbon and low alloy steel plate and universal sections—Test methods and quality classification
1733	Methods for the determination of grain size in metals
2291	Metallic materials—Tensile testing at elevated temperatures
2706	Numerical values—Rounding and interpretation of limiting values
AS/NZS	
1050	Methods for the analysis of iron and steel (all parts)
1365	Tolerances for flat-rolled steel products
3992	Pressure equipment—Welding and brazing qualification
ISO	
2566	Steel—Conversion of elongation values
2566-1	Part 1: Carbon and low alloy steels
9328	Steel flat products for pressure purposes—Technical delivery conditions
9328-2	Part 2: Non-alloy and alloy steels with specified elevated temperature properties