AS 3597—2008

Australian Standard®

Structural and pressure vessel steel—Quenched and tempered plate

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- AUSTROADS
- Association of Consulting Engineers Australia
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Steel Institute
- Bureau of Steel Manufacturers of Australia
- Business New Zealand
- Steel Construction New Zealand
- University of New South Wales
- University of Sydney
- University of Western Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee BD-023, Structural Steel, to supersede AS 3597—1993.

The objective of this Standard is to cover the technical aspects of supply of intermediate and high-strength quenched and tempered steel plates for structural and pressure vessel applications.

This edition incorporates the following major changes to the previous edition:

(a) The introduction of grades of steel with good weldability, formability and low temperature toughness.

(b) The introduction of a minimum thickness of 3 mm to a maximum thickness of 110 mm for intermediate and high-strength quenched and tempered low-alloy steel plates.

(c) The introduction of new Grades 900 and 1000. Grades 500, 600, 700, 900 and 1000 high-strength low-alloy steels are intended for use in structural applications and mechanically tested on a batch basis in line with the requirements of ASTM A514, *Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding* and BS EN 10025-6, *Hot Rolled Products of Structural Steels*, Part 6: *Technical Delivery Conditions for Flat Products of High Yield Strength Structural Steels in the Quenched and Tempered Condition*.

(d) The introduction of new Grades 500PV and 600PV. Grades 500PV, 600PV and 700PV low-alloy steels intended for use in pressure vessels and mechanically tested in line with the requirements of ASTM A517, *Specification for Pressure Vessel Plates, Alloy Steel, High-Strength, Quenched and Tempered* and BS EN 10028-6, *Flat Products Made of Steels for Pressure Purposes*, Part 6: *Weldable Fine Grain Steels, Quenched and Tempered*.

The only significant differences between Grades 500, 600, 700, 900, 1000 and 500PV, 600PV and 700PV are the nature and frequency of mechanical tests. The mechanical properties of each Grade are developed by quenching and tempering after plate rolling.

The unification of these Grades into one Standard is meant to provide maximum availability for users and to reduce costs. Grades 500, 600 and 700 may be used in lieu of Grades 500PV, 600PV and 700PV respectively, if the results of additional testing are satisfactory (see Appendix D).

A statement expressed in mandatory terms in a note to a table in the body of this Standard is deemed to be a requirement 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 this Standard, whereas an 'informative' appendix is only for information and guidance.

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1 SCOPE

This Standard specifies technical requirements for the production and supply of intermediate and high-strength quenched and tempered low-alloy steel plates from a minimum thickness of 3 mm to a maximum thickness of 110 mm. It is intended for use in fusion welded structures and pressure vessels.

NOTE: Guidelines on information that should be specified by the purchaser and matters that should or may be agreed on at the time of enquiry and order are given in Appendix A.

2 NORMATIVE REFERENCES

The following documents are indispensable to the application of this Standard:

NOTE: Documents referenced for 'informative' purposes are listed in the Bibliography.

AS	
1210	Pressure vessels
1391	Metallic materials—Tensile testing at ambient temperature
1544 1544.2	Methods for impact tests on metals Part 2: Charpy V-notch
1548	Fine grained, weldable steel plates for pressure equipment
1710	Non-destructive testing—Ultrasonic testing of carbon and low alloy steel plate and universal sections—Test methods and quality classification
2706	Numerical values—Rounding and interpretation of limiting values
AS/NZS	
1050 1050.1	Methods for the analysis of iron and steel Part 1: Sampling iron and steel for chemical analysis
1365	Tolerances for flat-rolled steel products
1554 1554.4	Structural steel welding Part 4: Welding of high strength quenched and tempered steels
ASTM	
E208	Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels
A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
A514/A514M-05	Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding
A517/A517M-06	Specification for Pressure Vessel Plates, Alloy Steel, High-Strength, Quenched and Tempered