

AS 3990—1993
Reconfirmed 2016

Australian Standard®

Mechanical equipment—Steelwork

This Australian Standard was prepared by Committee ME/5, Cranes (Balloted by ME/1, Boilers and Pressure Vessels; ME/4, Lift Installations; ME/5, Cranes; ME/18, Mining Equipment; ME/38, Gas and Liquid Petroleum Piping Systems; ME/43, Bulk Handling Equipment). It was approved on behalf of the Council of Standards Australia on 24 February 1993 and published on 17 May 1993.

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STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 3990—1993

Mechanical equipment—Steelwork

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Technical Committee ME-005 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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NOTES

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Mechanical equipment—Steelwork

AS 3990 first published in part as AS CAI—1933.
Second edition 1939.
Revised and issued as SAA Int. 351—1952.
Revised and issued as AS CAI—1968.
Fourth edition 1972.
AS 1250 first published 1972.
AS CAI—1972 and AS 1250—1972 revised, amalgamated
and issued as AS 1250—1975.
AS CAI—1972 withdrawn 1976.
Third edition as AS 1250—1981.
Revised and redesignated in part as AS 3990(Int)—1991.
Revised and issued as AS 3990—1993.

PREFACE

This Standard was prepared by the Standards Australia Committee on Cranes and balloted by the Standards Australia Committees for Boilers and Unfired Pressure Vessels, Lift Installations, Cranes, Mining Equipment, Gas and Liquid Petroleum Piping Systems, and Bulk Handling Equipment to provide a working stress method for the design of mechanical equipment steelwork. AS 1250—1981, *SAA Steel Structures Code*, which provided a working stress method, was superseded by AS 4100—1990, *Steel structures*, which provides the limit states design method.

Although the limit states design method (AS 4100) is the preferred method of designing steelwork, it is necessary to continue the working stress design method (this Standard) for certain mechanical equipment where the application Standards allow. This is particularly so for mechanical equipment where the equivalent international Standards use the working stress design method.

While the editorial style and layout have been updated, this Standard incorporates the minimum changes necessary to AS 1250—1981, *SAA Steel Structures Code*. Amendments 1 and 2 have been incorporated into the text. Section 10 has been deleted, Section 11 renumbered and new Appendices F and G added. Clauses 1.1, 2.2, 3.3.1, 3.3.5, 3.5.2, 10.1.1, 10.1.4 and 10.1.5; and Appendix C have been revised.

The issue of this Standard follows its publication as an Interim Standard in December 1991. Section 1 and Appendix G have been revised, a new Application Clause included and Reference Standards updated to current editions.

Attention is drawn to the following Standards which may be required for use in connection with this Standard:

AS

- 1110 ISO metric hexagon precision bolts and screws
- 1111 ISO metric hexagon commercial bolts and screws
- 1112 ISO metric hexagon nuts, including thin nuts, slotted nuts and castle nuts
- 1163 Structural steel hollow sections
- 1170 SAA Loading Code
 - 1170.1 Part 1: Dead and live loads and load combinations
 - 1170.2 Part 2: Wind loads
 - 1170.3 Part 3: Snow loads
- 1252 High strength steel bolts with associated nuts and washers for structural engineering
- 1275 Metric screw threads for fasteners
- 1302 Steel reinforcing bars for concrete
- 1303 Steel reinforcing wire for concrete
- 1379 The specification and manufacture of concrete
- 1391 Methods for tensile testing of metals
- 1410 SAA Crane Code
- 1554 SAA Structural Steel Welding Code
 - 1554.1 Part 1: Welding of steel structures
 - 1554.2 Part 2: Arc stud welding (steel studs to steel)
 - 1554.5 Part 5: Welding of steel structures subject to high levels of fatigue loading

- 1559 Fasteners—Bolts, nuts and washers for tower construction
- 1594 Hot-rolled steel flat products
- 1627 Metal finishing—Preparation and pretreatment of surfaces
- 1627.7 Part 7: Hand tool cleaning of metal surfaces
- 2074 Steel castings
- 2121 SAA Earthquake Code
- 2214 SAA Structural Steel Welding Supervisors Certification Code
- 2312 Guide to the protection of iron and steel against exterior atmospheric corrosion
- 2812 Welding, brazing and cutting of metals—Glossary of terms
- 3600 Concrete structures
- 3678 Structural steel—Hot-rolled plates, floorplates and slabs
- 3679 Structural steel
- 3679.1 Part 1: Hot-rolled bars and sections
- 3679.2 Part 2: Welded sections
- 4100 Steel structures
- BS
- 5135 Metal-arc welding of carbon and carbon manganese steels
- Supplement 1 (PD 3343) to BS 449,
Part 1: Recommendations for design (withdrawn)

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STANDARDS AUSTRALIA

 Australian Standard

 Mechanical equipment—steelwork

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard applies to the design, fabrication, erection, repair and alteration of steelwork associated with boilers and pressure vessels, lifts, cranes, mining equipment, gas and liquid petroleum piping systems, bulk handling equipment and the like, in accordance with the working stress design method.

The Standard does not apply to the following structures and materials:

- (a) Road and railway bridges.
- (b) Steel elements, other than packers, less than 3 mm thick.
- (c) Steel for which the value F_Y used in design exceeds 450 MPa.
- (d) Cold-formed members other than those complying with AS 1163.

Steelwork may be designed to—

- (i) the limit states design method of AS 4100; or
- (ii) the working stress design method of AS 3990 (this Standard).

NOTE: It is intended that the working stress method will be phased out in Australia as it is phased out internationally.

1.2 APPLICATION This Standard is intended to apply to steelwork associated with mechanical equipment such as boilers and pressure vessels, lifts, cranes, mining equipment, gas and liquid petroleum piping systems and bulk handling equipment.

1.3 STANDARDS Unless otherwise noted, a Standard referred to in this Standard is the current edition thereof.

1.4 NEW MATERIALS OR METHODS This Standard shall not be interpreted to prevent the use of materials or of methods of design or construction not specifically referred to herein.

NOTE: It will be necessary to seek approval from the Building Authority for the use of new materials or methods.

1.5 DESIGN AND SUPERVISION

1.5.1 Design The design of a structure or the part of a structure to which this standard is applied shall be the responsibility of an engineer experienced in the design of such structures.

For the purposes of this Standard the term 'Design Engineer' shall mean the Engineer responsible for design and shall include his representative.