

AS/NZS 3678:1996
Structural steel—Hot-rolled
plates, floorplates and slabs
(In Professional Package 55A)
22pp FF
Specifies requirements for the
production and supply of hot-
rolled structural steel plates,
floorplates and slabs for general
structural and engineering
applications. It also specifies
requirements for the production
and supply of wide slabs as fully
killed analysis-only steel.
(BD/23): Supersedes AS 3678—1990.
DR 94332: Publication date 1996-02-05.

DR 94332
1996 ed
FWD 951031
AS 3678—1990

REVISED.

Amclt 1.

Australian Standard®

Hot-rolled structural steel plates, floorplates and slabs

Structural steel — Hot-rolled plates, floorplates
& slabs (amclt 1)



This Australian Standard was prepared by Committee BD/23, Structural Steel. It was approved on behalf of the Council of Standards Australia on 6 October 1989 and published on 26 January 1990.

The following interests are represented on Committee BD/23:

Australian Institute of Steel Construction
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Institute of Steel Service Centres of Australia
Metal Trades Industry Association of Australia
National Association of Australian State Road Authorities
Railways of Australia Committee
Steel Reinforcement Institute of Australia
University of New South Wales
University of Sydney

Review of Australian Standards. To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up-to-date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 87234.

Australian Standard®

**Hot-rolled structural steel plates,
floorplates and slabs**

For history before 1989, see Preface.
Parts of AS 1204—1980, AS 1205—1980 and
AS 1227—1980 revised, amalgamated and redesignated
AS 3678—1990.

PREFACE

This Standard was prepared by the Standards Australia Committee on Structural Steel. It supersedes the following Standards of which it is a revision and amalgamation in part:

- AS 1204—1980 *Structural steels—Ordinary weldable grades.* (First published as part of AS A1.1—1956 and AS A33—1955. These were revised and redesignated as AS A149—1965. AS A149—1965, AS A135—1965 and AS A149—1966 revised and redesignated AS A186—1971. This was subsequently revised and redesignated as AS 1204—1972; second edition 1980)
- AS 1205—1980 *Structural steels—Weather-resistant weldable grades.* (First published as AS A187—1971 and revised and redesignated AS 1205—1972; second edition 1980)
- AS 1227—1980 *General requirements for the supply of hot rolled steelplates, sections, piling and bars for structural purposes.* (First published as part of AS A1—1956 which was revised and redesignated AS A147—1965; second edition 1971. AS A147 was revised and redesignated AS 1227 in 1974; second edition 1980.)

Parts of AS 1204—1980, AS 1205—1980 and AS 1227—1980 revised, amalgamated and redesignated AS 3678—1990.

Major technical changes introduced by this Standard are as follows:

- (a) New Grade 400 has been included.
- (b) Tensile strength on Grade 350 and WR350 has been reduced to 450 MPa. This reduction in tensile strength is expected to enable the supply of better weldable 350 and WR350 grades.
- (c) Determination of compliance guidelines on Sampling, Frequency of Testing and Retests have been moved to Appendix B in line with Standards Australia policy.

It was decided to revise and amalgamate the above Standards in an effort to produce a complete product-based Standard which has been rationalized in relation to tolerance requirements.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the Head Office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
1 SCOPE	4
2 REFERENCED DOCUMENTS	4
3 DEFINITIONS	4
4 DESIGNATION	5
5 CHEMICAL COMPOSITION	5
6 DENSITY	6
7 MANUFACTURING TOLERANCES	6
8 FREEDOM FROM DEFECTS	7
9 REMOVAL OF SURFACE DEFECTS	7
10 SELECTION OF TEST SAMPLES	7
11 POSITION AND ORIENTATION OF TEST PIECES	7
12 PREPARATION OF TEST PIECES FOR TESTING	7
13 TESTING PROCEDURES	8
14 MECHANICAL TEST REQUIREMENTS	8
15 MARKING	8
16 ROUNDING OF NUMBERS	9
 APPENDICES	
A PURCHASING GUIDELINES	10
B DETERMINATION OF COMPLIANCE OF A BATCH	12
C COLD-BENDING AND HOT-FORMING OF PLATE DURING FABRICATION	15

STANDARDS AUSTRALIA

Australian Standard

Hot-rolled structural steel plates, floorplates and slabs

1 SCOPE. This Standard specifies requirements for the production and supply of hot-rolled structural steel plates and floorplates for carbon and carbon-manganese mechanically-tested steels, fully-killed analysis-only steels, and low-alloy (weathering) mechanically-tested steels. This Standard also specifies requirements for the production and supply of wide slabs as fully-killed analysis-only steel in accordance with Table 2.

For general structural and engineering applications, all mechanically-tested grades, and analysis grades with carbon less than 0.30, are suitable for—

- (a) welding in accordance with the requirements and procedures specified in AS 1554.1; or
- (b) riveting and bolting as specified in AS 1250 and AS 1511.

This Standard does not cover the following:

- (i) Bars, sections and piling bars (see AS 3679).
- (ii) Steel plates for boilers and pressure vessels (see AS 1548).
- (iii) Structural steel hollow sections (see AS 1163).
- (iv) ~~Steel plates for oil storage tank construction (see AS 2624).~~ *Amcl 1.*

IV (v) ~~Plate, strip and sheet (see AS 1594).~~

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

2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS	
1050	Methods for the analysis of iron and steel
1163	Structural steel hollow sections
1199	Sampling procedures and tables for inspection by attributes
1213	Iron and steel—Methods of sampling
1250	SAA Steel Structures Code
1365	Tolerances for flat-rolled steel products
1391	Methods for tensile testing of metals
1399	Guide to AS 1199, Sampling procedures and tables for inspection by attributes
1511	SAA High-strength Structural Bolting Code
1544	Methods for impact tests on metals
1544.2	Part 2: Charpy V-notch
1548	Steel plates for boilers and pressure vessels
1553	Covered electrodes for welding
1553.1	Part 1: Low carbon steel electrodes for manual metal-arc welding of carbon and carbon-manganese steels
1554	Structural steel welding
1554.1	Part 1: Welding of steel structures
1594	Hot-rolled low carbon steel plate, sheet and strip

1710	Non-destructive testing of carbon and low alloy steel plate—Test methods and quality classification
1821-23	Suppliers Quality Systems
1821	Suppliers quality systems for design, development production and installation
1822	Suppliers quality systems for production and installation
1823	Suppliers quality inspection systems
2000	Guide to AS 1821-23—Suppliers quality systems
2490	Sampling procedures and charts for inspection by variables for percent defective
2624	Steel plate and strip for the construction of welded steel tanks for oil storage
2706	Numerical values—Rounding and interpretation of limiting values
K1	Methods for the sampling and analysis of iron and steel
3679	Hot-rolled structural steel bars and sections
3900	Quality systems—Guide to selection and use
3901	Quality systems for design/development, production, installation and servicing
3902	Quality systems for production and installation
3903	Quality systems for final inspection and test
3904	Quality systems—Guide to quality management and quality system elements
ISO	
2566/1	Steel—Conversion of elongation values Part 1: Carbon and low alloy steels

3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

3.1 Analysis.

3.1.1 Cast analysis—chemical analysis determined from test samples taken from the ladle during casting.

3.1.2 Product analysis—chemical analysis determined from a test sample of the finished material.

3.2 Controlled rolled—hot-rolling with control of both temperature and rolling reduction to achieve the desired mechanical properties and microstructure.

3.3 Edge conditions.

3.3.1 Trimmed edge—edge produced by the removal of material by mechanical means or gas cutting—also referred to as sheared, slit or gas cut edge.

3.3.2 Untrimmed edge—edge produced by the rolling between horizontal rolls, with or without vertical edging rolls—also referred to as mill, universal or as-rolled edge.

3.4 Floorplate—hot-rolled product supplied flat, having a rolled raised pattern at regular intervals on one surface, with width greater than or equal to