

AS/NZS 1554.1:2011

AS/NZS 1554.1:2011

Australian/New Zealand Standard™

**Structural steel welding**

**Part 1: Welding of steel structures**



## **AS/NZS 1554.1:2011**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WD-003, Welding of Structures. It was approved on behalf of the Council of Standards Australia on 18 May 2011 and on behalf of the Council of Standards New Zealand on 1 June 2011.

This Standard was published on 17 June 2011.

---

The following are represented on Committee WD-003:

Australian Chamber of Commerce and Industry  
Australian Industry Group  
Australian Steel Institute  
AUSTROADS  
Bureau of Steel Manufacturers of Australia  
New Zealand Heavy Engineering Research Association  
New Zealand Non-destructive Testing Association  
Steel Reinforcement Institute of Australia  
The University of Sydney  
Welding Technology Institute of Australia

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at [www.saiglobal.com.au](http://www.saiglobal.com.au) or Standards New Zealand web site at [www.standards.co.nz](http://www.standards.co.nz) and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

---

AS/NZS 1554.1:2011

Australian/New Zealand Standard™

## **Structural steel welding**

### **Part 1: Welding of steel structures**

Originated in Australia as AS CA8—1933.  
Originated in New Zealand, in part, as NZS 4701:1981.  
Previous edition AS/NZS 1554.1:2004.  
Eighth edition 2011.

#### **COPYRIGHT**

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, Private Bag 2439, Wellington 6140

ISBN 978 0 7337 9873 3

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WD-003, Welding of Structures, to supersede AS/NZS 1554.1:2004.

The objective of this Standard is to provide rules for the welding of a wide range of steel constructions and while it is expected that its main use will be for statically loaded welds, it applies also to some welds subject to fatigue. Although this Standard has been specifically prepared for steel structures, it may be usefully applied to machine frames and other types of steel constructions.

This edition incorporates the following major changes to the 2004 edition:

(a) *Amendments to the following Clauses:*

1.2, 1.7 (new title), 1.7.1 (new), 2.1(c), 2.3.1, 3.2.5 (new paragraph), 4.1.2(d)(f)(h)(j)(k) (new sub clauses), 4.1.2 (k), 4.2 (b), 4.6.1.1, 4.6.1.3 (new), 4.10 (new note), 4.12.2, 5.1.1 (new note), 5.1.2 (note added), 5.3.3 (second paragraph—new), 5.3.4 (note added), 5.3.5 (new), 5.7.1 (note added), 6.4.3 (note added), 7.2(a) (new), 7.3 (first paragraph—new), Appendix F (new), Appendix G (new).

(b) *Amendments to the following Tables:*

4.6.1(A), 4.6.1(B), 4.6.1(C), 4.6.2, 4.7.1 (new notes, notes 1 and 3 amended), 4.11(D) (new), 4.11(A) (items b, e, o, u), 4.11(C) item (d), 4.12.2.3 (A), 4.12.2.3(B) (new), 5.3.4(A), B1 (new steel types added), E4 (items deleted).

(c) *Amendments to the following Figure:*

3.2.5(c) (new).

The Standard requires that weld preparations, welding consumables and welding procedures be qualified before commencement of welding. Prequalified joint preparations, welding consumables and welding procedures are also given in the Standard.

The Standard, in catering for structures subject to fatigue conditions as well as statically loaded structures, provides two categories of welds with two differing levels of weld quality assurance associated with the different types of service to which the welds are subjected. The intention is that the designer select the category suited to the severity of the service and nominate this on the drawings. Where a structure contains both categories, this nomination of appropriate categories will ensure that appropriate levels of supervision and inspection will be applied to the relevant parts of the structure.

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.

## CONTENTS

	<i>Page</i>
<b>SECTION 1 SCOPE AND GENERAL</b>	
1.1 SCOPE .....	5
1.2 EXCLUSIONS .....	6
1.3 INNOVATION .....	6
1.4 NORMATIVE REFERENCES .....	6
1.5 DEFINITIONS AND SYMBOLS .....	6
1.6 WELD CATEGORIES .....	7
1.7 MANAGEMENT OF QUALITY .....	7
1.8 SAFETY .....	8
<b>SECTION 2 MATERIALS OF CONSTRUCTION</b>	
2.1 PARENT MATERIAL .....	9
2.2 BACKING MATERIAL .....	9
2.3 WELDING CONSUMABLES .....	9
<b>SECTION 3 DETAILS OF WELDED CONNECTIONS</b>	
3.1 GENERAL .....	11
3.2 BUTT WELDS .....	11
3.3 FILLET WELDS .....	12
3.4 COMPOUND WELDS .....	16
3.5 SEAL WELDS .....	17
3.6 PLUG WELDS .....	18
3.7 SLOT WELDS .....	18
3.8 COMBINING STEEL SECTIONS .....	18
<b>SECTION 4 QUALIFICATION OF PROCEDURES AND PERSONNEL</b>	
4.1 QUALIFICATION OF WELDING PROCEDURE .....	20
4.2 METHODS FOR QUALIFYING A WELDING PROCEDURE .....	22
4.3 PREQUALIFIED WELDING PROCEDURES .....	22
4.4 PORTABILITY OF QUALIFIED WELDING PROCEDURES .....	23
4.5 PREQUALIFIED JOINT PREPARATIONS .....	23
4.6 QUALIFICATION OF WELDING CONSUMABLES .....	30
4.7 QUALIFICATION OF WELDING PROCEDURE BY TESTING .....	38
4.8 EXTENSION OF QUALIFICATION .....	42
4.9 COMBINATION OF PROCESSES .....	43
4.10 RECORDS OF TESTS .....	43
4.11 REQUALIFICATION OF WELDING PROCEDURES .....	43
4.12 QUALIFICATION OF WELDING PERSONNEL .....	47
<b>SECTION 5 WORKMANSHIP</b>	
5.1 PREPARATION OF EDGES FOR WELDING .....	51
5.2 ASSEMBLY .....	51
5.3 PREHEATING AND INTER-RUN CONTROL .....	52
5.4 WELDING UNDER ADVERSE WEATHER CONDITIONS .....	59
5.5 TACK WELDS .....	59
5.6 WELD DEPTH-TO-WIDTH RATIO .....	59
5.7 CONTROL OF DISTORTION AND RESIDUAL STRESS .....	60
5.8 BACKGOUGING AND REPAIR OF DEFECTS IN WELDS .....	61
5.9 TEMPORARY ATTACHMENTS .....	62

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- Looking for additional Standards? Visit Intertek Inform Infostore
  - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-