

Australian Standard<sup>®</sup>

---

**Welding of steel castings**

---

This Australian Standard was prepared by Committee WD/7, Welding of Steel Casting. It was approved on behalf of the Council of Standards Australia on 8 November 1988 and published on 26 June 1989.

---

The following interests are represented on Committee WD/7:

Australian Welding Research Association  
Bureau of Steel Manufacturers of Australia  
Confederation of Australian Industry  
Department of Industrial Relations and Employment, N.S.W.  
Electricity Supply Association of Australia  
Institute of Australian Foundrymen (N.S.W. Division)  
Metal Trades Industry Association of Australia  
Railways of Australia Committee

---

***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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.*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 87265.*

AS 1988—1989

Australian Standard<sup>®</sup>

---

**Welding of steel castings**

---

First published as AS 1988—1977.  
Second edition 1989.

PUBLISHED BY STANDARDS AUSTRALIA  
(STANDARDS ASSOCIATION OF AUSTRALIA)  
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 5446 0

## PREFACE

This Standard was prepared by Standards Australia's Committee on Welding of Steel Castings, to supersede AS 1988—1977, *Code of practice for fusion welding in the production, rectification and repair of steel castings*.

The 1977 edition was prepared as a code of practice to set out recommendations for the fusion welding of steel castings. This edition sets out specific requirements for the task.

This Standard is generally based on the 1985 edition of BS 4570, *Specification for fusion welding of steel castings*.

Steel castings may require welding to make them satisfactory for their intended service, and this has long been accepted as part of the normal production process. The procedures in this Standard can be specified to ensure good welding practice during the production, repair, rectification, and fabrication of steel castings. In fabrication, the use of welding has to be taken into account at the design and foundry stages.

Statements expressed in mandatory terms in Notes to Tables are deemed to be requirements of this Standard.

© 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>
SECTION 1. SCOPE AND GENERAL	
1.1 SCOPE . . . . .	4
1.2 REFERENCED DOCUMENTS . . . . .	4
1.3 DEFINITIONS . . . . .	4
SECTION 2. CASTINGS AND WELDING PROCEDURES	
2.1 CASTINGS . . . . .	4
2.2 WELDING PROCEDURES . . . . .	4
SECTION 3. EQUIPMENT AND WELDING CONSUMABLES	
3.1 EQUIPMENT . . . . .	9
3.2 WELDING CONSUMABLES . . . . .	9
SECTION 4. PREPARATION FOR WELDING	
4.1 TYPES OF WELD PREPARATION . . . . .	10
4.2 METHODS OF PREPARATION . . . . .	11
4.3 FUSION FACES . . . . .	11
4.4 BACKING MATERIALS . . . . .	11
SECTION 5. ASSEMBLY (FABRICATION WELDING)	
5.1 GENERAL . . . . .	12
5.2 PREHEATING . . . . .	12
5.3 CONSUMABLES . . . . .	12
5.4 REMOVING WELDED-ON BRIDGE PIECES . . . . .	12
SECTION 6. PRECAUTIONS ASSOCIATED WITH WELDING	
6.1 DISTORTION . . . . .	12
6.2 ARC STRIKES . . . . .	12
6.3 INTERRUPT CLEANING . . . . .	12
SECTION 7. PREHEATING AND POSTWELD HEAT TREATMENT	
7.1 PREHEATING . . . . .	13
7.2 COOLING AFTER WELDING . . . . .	13
7.3 POSTWELD HEAT TREATMENT . . . . .	13
7.4 TEMPERATURE MEASUREMENT . . . . .	13
SECTION 8. DRESSING AND INSPECTION	
8.1 DRESSING . . . . .	13
8.2 INSPECTION OF COMPLETED WELDS . . . . .	13
8.3 RECORDS OF LOCATION OF WELDS . . . . .	13
SECTION 9. QUALIFICATION OF WELDING PROCEDURE AND WELDING PERSONNEL	
9.1 QUALIFICATION OF WELDING PROCEDURE . . . . .	14
9.2 QUALIFICATION OF WELDING PERSONNEL . . . . .	15
APPENDICES	
A PURCHASING GUIDELINES AND ITEMS FOR AGREEMENT BETWEEN THE CONTRACTING PARTIES . . . . .	19
B RECOMMENDED FORM FOR WELDING PROCEDURE TEST RECORDS . . . . .	20
C LIST OF REFERENCED DOCUMENTS . . . . .	21

## STANDARDS AUSTRALIA

**Australian Standard**  
**Welding of steel castings**

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This Standard specifies requirements for the fusion welding of steel casting where it is used—

- (a) to rectify a casting as part of the normal production process;
- (b) to rectify a casting that has been in service; and
- (c) for the joining together of steel castings by fusion welding, where the subsections of the final fabrication are designed for that purpose or where welding is introduced at the foundry planning stage.

This Standard covers the manual metal-arc, gas-shielded, self-shielded, and submerged-arc welding of the materials given in Table 2.1 and Table 2.2, but additional guidance for other processes has been given in some clauses.

Although this Standard does not directly cover the welding of steel castings to wrought steels, it may be

used as a guide for the fabrication by joining of these forms of steel involving similar and dissimilar metals.

**1.2 REFERENCED DOCUMENTS.** A list with titles of documents referred to in this Standard is given in Appendix C.

**1.3 DEFINITIONS.** For the purpose of this Standard, the definitions given in AS 2812 and those below apply.

**1.3.1 Contractor**—the person or organization responsible for the production or welding of the casting.

**1.3.2 Shall**—indicates that a requirement is mandatory.

**1.3.3 Should**—indicates a recommendation.

## SECTION 2. CASTINGS AND WELDING PROCEDURES

**2.1 CASTINGS.** The steel castings to be welded shall have been made from any of the types of steels given in Table 2.1 or Table 2.2.

**2.2 WELDING PROCEDURES.** The manufacturer shall maintain written details of the welding procedures to be used.

## NOTES:

1. Where required by the purchaser, the manufacturer should supply the details of the welding procedure for approval by the purchaser before welding commences. (See Appendix A, and also Section 9.)
2. Where it is necessary, in fabrication welding, to join steel castings of widely different chemical composition, the preheating temperature, welding consumables, and postweld heat treatment should be agreed between the contracting parties (see Appendix A).