

# Australian Standard 1442—1983

---

## CARBON STEELS AND CARBON- MANGANESE STEELS HOT-ROLLED BARS AND SEMI-FINISHED PRODUCTS

[Title allocated by Defence Cataloguing Authority:  
METAL BARS, SHEETS AND SHAPES (Carbon and Carbon-  
Manganese Steels, Hot-rolled)...NSC Group 95]

---



**STANDARDS ASSOCIATION OF AUSTRALIA**  
*Incorporated by Royal Charter*



This Australian standard was prepared by Committee MT/1, Iron and Steel. It was approved on behalf of the Council of the Standards Association of Australia on 8 February 1983 and published on 9 May 1983.

---

The following interests are represented on Committee MT/1:

Australasian Institute of Metals  
Australian Foundry Institute  
Bureau of Steel Manufacturers of Australia  
Confederation of Australian Industry  
Department of Defence  
Department of Industry and Commerce  
Institute of Steel Service Centres of Australia  
Metal Trades Industry Association of Australia  
Railways of Australia Committee  
Society of Automotive Engineers, Australasia

---

To keep abreast of progress in industry, Australian standards are subject to continuous 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 their standards are up-to-date. Full details of all SAA publications will be found in the Annual List of Australian Standards; these details are supplemented by listings in the SAA monthly journal 'The Australian Standard'. Information on the Annual List and 'The Australian Standard' may be obtained from any sales office of the Association, where details are also available of the current status of individual standards. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

---

*This standard was issued in draft form for comment as DR 81307.*

**AUSTRALIAN STANDARD**

**CARBON STEELS AND CARBON-  
MANGANESE STEELS  
HOT-ROLLED BARS AND  
SEMI-FINISHED PRODUCTS**

**AS 1442—1983**

First published .....	1973
Second edition .....	1979
Third edition .....	1983

**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA  
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.**



ISBN 0 7262 2966 0

## PREFACE

This edition of this standard was prepared under the direction of the Association's Committee on Iron and Steel by its subcommittee on carbon and alloy steels, to supersede AS 1442—1979. It applies, in particular, to hot-rolled carbon and carbon-manganese steels for general engineering purposes, supplied in the form of rods, bars for machining, and bars, billets, blooms and slabs for forging, to specified chemical composition only, or to specified chemical composition and mechanical properties for the as-rolled or normalized condition.

In this edition, contractual requirements have been rationalized to produce more concise guidelines to purchasers ordering to the standard; Appendix A presents these guidelines and directs attention to matters requiring consideration at the time of enquiry and/order. The intention is to avoid misinterpretation and to ensure a clear understanding of product requirements by both purchaser and supplier.

The definitions of products adopted in this standard are based on those established by Subcommittee 2, Terminology, Classification and Designation of Steel, of Technical Committee 17, Steel, of the International Organization for Standardization (ISO).

The attention of users of the standard is drawn to the fact that semi-killed steels may not be as homogeneous as fully-killed steels and, therefore, may not be as suitable for critical applications, particularly in the higher carbon grades.

Enquiries seeking information regarding the availability of hot-rolled carbon and carbon-manganese steels not listed in this standard should be directed to the steel suppliers. In addition, information regarding the mechanical properties which can be obtained from a number of grades specified on a composition basis only in this standard is contained in the following publication:

ASTM A400 Recommended Practice for Selection of Steel Bar Compositions  
According to Section.

Those requiring information on welding of steel are referred to the steel manufacturer or to the Australian Welding Research Association's Technical Note 1, The Weldability of Steels.

© Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1983

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

## CONTENTS

	<i>Page</i>
<b>SPECIFICATION</b>	
1 Scope ....	4
2 Referenced Documents ....	4
3 Designation ....	4
4 Definitions ....	5
5 Steelmaking Process ....	5
6 Condition of Steel on Delivery ....	5
7 Chemical Composition ....	5
8 Freedom from Defects ....	5
9 Austenite Grain Size ....	6
10 Manufacturing Tolerances—Bars and Rods ....	6
11 Selection of Test Samples ....	6
12 Location of Test Pieces ....	6
13 Tensile Test ....	6
14 Retests ....	6
15 Identification ....	6
16 Rounding of Results Obtained by Inspection and Testing ....	7
<b>APPENDICES</b>	
A Purchasing Guidelines ....	12
B Recommended Machining Allowances for Bars, Ordered to 'B' and 'F' Finish ....	14
C Rounding of Results Obtained by Inspection and Testing ....	15

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

for

## CARBON STEELS AND CARBON-MANGANESE STEELS—HOT-ROLLED BARS AND SEMI-FINISHED PRODUCTS

**1 SCOPE.** This standard specifies requirements for carbon steel and carbon-manganese steel rods, bars, blooms, billets and slabs, for forging and for general engineering purposes. The standard provides for the supply of steel to specified chemical composition only (Tables 1 to 6) or to specified chemical composition and mechanical properties (Table 7).

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

**2 REFERENCED DOCUMENTS.** The following standards are referred to in this standard:

AS 1050	Methods for the Analysis of Iron and Steel
AS 1171	Methods for Magnetic Particle Testing of Ferromagnetic Products and Components
AS 1213	Iron and Steel—Methods of Sampling
AS 1391	Methods for Tensile Testing of Metals
AS 1733	Methods for the Determination of Grain Size in Metals
AS 2062	Methods for Non-destructive Penetrant Testing of Products and Components
AS 2084	Methods for Eddy Current Testing of Metal Bar and Tubular Products
AS 2338	Preferred Dimensions of Wrought Metal Products
AS K1	Methods for the Sampling and Analysis of Iron and Steel
ISO 2566/1	Steel—Conversion of Elongation Values—Part 1: Carbon and Low Alloy Steels

### 3 DESIGNATION.

**3.1 Steels Supplied to Chemical Composition Only** (See Tables 1 to 6).

**3.1.1 General.** For steels supplied to specified composition in accordance with Table 1, 2, 3, 4, 5 or 6, the steel designation shall consist of the following:

- The number of this Australian standard, i.e. AS 1442.
- A prefix letter to indicate the degree of killing or deoxidation in accordance with Clause 3.1.2.
- A series designation in accordance with Clause 3.1.3.
- Modification symbols in accordance with Clause 3.1.4, where applicable.
- Suffix letters to indicate surface finish in accordance with Clause 3.1.5, where applicable.

**3.1.2 Degree of deoxidation.** The prefix letters indicating the degree of killing or deoxidation shall be as follows:

- R = rimming steel
- CS = semi-killed (balanced\*) steel (0.10 percent carbon range)
- S = semi-killed (balanced\*) steel (restricted carbon range)
- K = fully-killed steel.

**3.1.3 Series designation.** The following series designation shall be used to identify each group, whereby the first two digits of the number indicate the type of steel and the last two digits indicate the approximate mean of the specified carbon range:

- 10XX..... Plain carbon steels
- 11XX..... Sulphurized free-cutting carbon steels
- 12XX..... Phosphorized and sulphurized free-cutting carbon steels
- 13XX..... Carbon-manganese steels.

**3.1.4 Modification symbols.** The modification symbols shall be as follows:

- Deviation in chemical composition. The prefix letter 'X' shall be used to indicate a major deviation in chemical composition of any grade from the corresponding AISI-SAE grade, e.g. AS 1442/XK1038.
- Lead-bearing steels. The letter 'L' after the first two digits of the series designation (see Clause 3.1.3) shall be used to indicate lead-bearing steels, e.g. AS 1442/S12 L14.
- Aluminium-killed or boron-treated steels (Tables 4 and 6). Where steels conforming to Tables 4 and 6 are aluminium-killed or boron-treated, the designation shall be AS 1442/XXAXX or AS 1442/XXBXX, respectively.

**3.1.5 Surface finish.** The suffix letters 'B' and 'F' shall be used to indicate special surface conditions for bar in accordance with Clause 6.2, e.g. AS 1442/S1030B, AS 1442/S1030F.

**3.2 Steels Supplied to Chemical Composition and Mechanical Properties.** For steels supplied to chemical composition and mechanical properties in accordance with Table 7, the steel designation shall consist of the following:

- The number of this Australian standard, i.e. AS 1442.
- The prefix letters 'S' or 'K' in accordance with Clause 3.1.2 to indicate the degree of killing or deoxidation, e.g. AS 1442/S.

\*The term 'balanced steel' is sometimes used in the steel industry as a synonym for semi-killed steel.