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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
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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

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AUSTRALIAN STANDARD

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

AS 1442—1983

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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.

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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:

(a) The number of this Australian standard, i.e. AS 1442.

(b) A prefix letter to indicate the degree of killing or deoxidation in accordance with Clause 3.1.2.

(c) A series designation in accordance with Clause 3.1.3.

(d) Modification symbols in accordance with Clause 3.1.4, where applicable.

(e) 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:

(a) 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.

(b) 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.

(c) 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:

(a) The number of this Australian standard, i.e. AS 1442.

(b) 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.