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Metals file

Australian Standard 1302—1982

STEEL REINFORCING BARS FOR CONCRETE

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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The following interests were represented on the committee responsible for the preparation of this standard:

Australian Institute of Steel Construction Limited

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Metal Trades Industry Association of Australia

National Association of Australian State Road Authorities

Public Works Department, N.S.W.

Railways of Australia Committee

Reinforcing Steel Suppliers

Steel Reinforcement Promotion Group

SAA committees on—
- Steel Structures
- Concrete Structures
- Prestressed Concrete Structures
- Iron and Steel Standards
- Testing of Metals

University of Melbourne

University of Sydney

AUSTRALIAN STANDARD

STEEL REINFORCING BARS FOR CONCRETE

AS 1302—1982

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PREFACE

This edition of this standard was prepared by the Association's Committee on Structural Steel to supersede AS 1302—1977.

Developmental work prior to the commencement of production of Grade 410Y hot-rolled deformed bars in Australia in 1982 has necessitated this minor revision. The minimum tensile strength for Grade 410Y bars specified in AS 1302—1977 had been found to be too restrictive and has been amended to the value specified in European standards. The minimum tensile strength specified for Grade 410C cold-worked deformed bars has also been amended to the same value.

Specific changes have been made in Clause 6 (formerly 1.5) and in Tables 1 and 5. An appendix has been added which presents purchasing guidelines, including contractual requirements previously covered in the body of AS 1302—1977, and which directs attention to matters requiring consideration at the time of enquiry and/or order. The intention of the appendix is to prevent misinterpretation or other problems and to ensure a clear understanding of product requirements by both purchaser and supplier. Other changes of an editorial nature have also been made.

NOTE TO 1983 REPRINT: This reprint incorporates Amendment No 1. To indicate Grade 410Y as a fully weldable bar, the maximum carbon and carbon equivalent values for Grade 410Y in Table 1 have been amended and a new formula for the carbon equivalent introduced in Note 1 to Table 1. Also, Clause 7.2 has been reworded to provide manufacturers greater flexibility in marking while still ensuring easy identification of Grade 410Y bars against Grade 230S bars.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
STEEL REINFORCING BARS FOR CONCRETE

1 SCOPE. This standard specifies requirements for two grades of steel bars for use as reinforcement for concrete.

NOTES:

1: Guidelines 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. For welding of bars to this standard, see AS 1480, SAA Concrete Structures Code, and AS 1554, SAA Structural Steel Welding Code, Part 3—Welding of Reinforcing Steel.

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

AS 1050	Methods for the Analysis of Iron and Steel
AS 1213	Methods for the Sampling of Iron, Steel, Permanent Magnet Alloys and Ferro-alloys
AS 1391	Methods for Tensile Testing of Metals
AS 1480	SAA Concrete Structures Code
AS 1554	SAA Structural Steel Welding Code Part 3—Welding of Reinforcing Steel
AS 2338	Preferred Dimensions of Wrought Metal Products
AS K1	Methods for the Sampling and Analysis of Iron and Steel

3 GRADES.

3.1 Designation. Bars shall be Grade 230 or Grade 410 in accordance with Clause 3.2 or 3.3, as applicable.

NOTE: The grade designation is a number indicating the specified minimum yield strength, i.e. yield stress or 0.2% proof stress, as appropriate, in megapascals (MPa) (see Table 5).

3.2 Grade 230. Grade 230 bars shall be hot-rolled bars and shall be either—

(a) deformed bars designated 230S; or

(b) plain bars designated 230R.

NOTE: AS 2338 lists preferred sizes for plain round bars.

3.3 Grade 410. Grade 410 bars shall be either—

(a) cold-worked deformed bars designated 410C, such bars prior to cold-working being Grade 230S hot-rolled deformed bars; or

(b) hot-rolled deformed bars designated 410Y.

3.4 Weldability. All grades shall be suitable for welding (see AS 1554, Part 3).

4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

4.1 Bar—a bar of steel of any form of cross-section as rolled.

4.2 Bar size—for a plain round bar, the diameter; or

—for a deformed bar, the diameter of a plain bar having the same mass per metre as the deformed bar; or

—for a square bar, the nominal length of the side of the bar.

4.3 Calculated mass per metre—the mass per metre calculated from the bar size on the basis of the density of the steel being 7850 kg/m^3.

4.4 Cold-worked deformed bar—a deformed bar which has had its yield strength raised by cold-working and has, in its cold-worked state, deformations complying with Clause 10.

4.5 Deformed bar—a steel bar, intended for use in concrete construction, the surface of which is provided with lugs or protrusions (hereinafter called 'deformations') which—

(a) inhibit longitudinal movement of the bar relative to the surrounding concrete; and

(b) comply with the requirements of Clause 10.

4.6 Lot—all bars of the same nominal size and type contained in an individual shipment.

4.7 Nominal area—the cross-sectional area of the bar calculated from the bar size and—

(a) for bars with calculated area greater than 100 mm^2, taken to the nearest 10 mm^2;

(b) for bars with calculated area less than 100 mm^2, taken to the nearest 1 mm^2 (see Table 4.)

5 STEELMAKING PROCESS. The steel shall be made by the open hearth, basic oxygen or an electric process.

NOTES:

1. A basic oxygen process means the process of making steel in a basic converter blown with commercially pure oxygen.
2. Additional refining by vacuum-arc-remelt (VAR), electro-slag-refining (ESR) or vacuum degassing is permitted.

6 CHEMICAL COMPOSITION.

6.1 General. The method of sampling for chemical analysis shall be in accordance with AS 1213. Chemical composition shall be determined by any procedures which are not less accurate than AS 1050 or AS K1.

6.2 Cast Analysis. A chemical analysis of the steel from each ladle shall be made to determine the proportions of the specified elements. In cases where it is impracticable to obtain samples from liquid steel, analysis of test samples taken in accordance with Clause 3.5 of AS 1213 may be reported as cast analysis.

The reported cast analysis of the steel shall conform to the limits given in Table 1 for the appropriate grade.