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Australian Standard 1449—1980

WROUGHT ALLOY STEELS—STAINLESS AND HEAT-RESISTING STEEL PLATE, SHEET AND STRIP

[Title allocated by Defence Cataloguing Authority: METAL PLATE, SHEET, STRIP (Stainless and Heat Resisting Steel in Coils and Cut Lengths)]

STANDARDS ASSOCIATION OF AUSTRALIA

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Institute of Petroleum

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Department of Productivity

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

WROUGHT ALLOY STEELS—STAINLESS AND HEAT-RESISTING STEEL PLATE, SHEET AND STRIP

AS 1449—1980

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PREFACE

This standard was prepared under the direction of the Association's Committee on Iron and Steel, by its subcommittee on stainless and heat-resisting steel plate, sheet and strip, to supersede the 1978 edition which was a revision of AS G31—1971.

The need for a new edition arose for two reasons, viz—

(a) problems in application of a 1 percent proof stress value from a testing point of view; and
(b) the increased usage of Type 444 stainless steel.

The standard now reflects 0.2 percent proof stress values and the addition of Type 444.

The standard applies to stainless and heat-resisting steels for general engineering purposes, supplied in the form of hot-rolled plates or as cold-rolled sheet and strip in coils and cut lengths. In the preparation of the 1978 edition, cognizance was taken of ASTM A 240, Specification for Heat-resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Fusion-welded Unfired Pressure Vessels, but provision was made for steels other than the AISI-SAE types. The various grades are still identified basically in the manner used by the American Iron and Steel Institute and the Society of Automotive Engineers.

Appendix A sets out purchasing guidelines, including contractual requirements previously included in the body of the standard, and directs attention to matters requiring consideration at the time of enquiry and/or order. The intention is to prevent misinterpretation and to ensure a clear understanding of product requirements by both purchaser and supplier.

This standard may require reference to the following Australian standards:

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 1815 Method for Rockwell Hardness Test
Part 1—Testing of Metals
AS 1816 Method for Brinell Hardness Test
Part 1—Testing of Metals
AS 2038 Method for Detecting the Susceptibility of Austenitic Stainless Steel to Intergranular Corrosion
AS 2338 Preferred Dimensions of Wrought Metal Products
AS ....* Method for Bend Testing of Metals
Part 1—Sheet, Strip and Plate
AS K1 Methods for the Sampling and Analysis of Iron and Steel.

* In course of preparation.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for WROUGHT ALLOY STEELS — STAINLESS AND HEAT-RESISTING STEEL PLATE, SHEET AND STRIP

1 SCOPE. This standard specifies requirements for stainless and heat-resisting steels for general engineering purposes, supplied as hot-rolled plates or as cold-rolled sheet and strip in coils or cut lengths.

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 DESIGNATION.

2.1 General. The steel designation as given in Tables 1, 2 and 3, shall comprise the following:

(a) The number of this Australian Standard, i.e. AS 1449.
(b) A three-digit number to indicate the grade, in accordance with Clause 2.2.
(c) Where necessary, a suffix letter or symbol to signify modifications to grades as given in Clause 2.3.

2.2 Series Designation. The following series designations shall be used to identify each group:

2XX—Chromium-nickel-manganese steels
NOTE: Non-hardenable, austenitic and non-magnetic

3XX—Chromium-nickel steels
NOTE: Non-hardenable, austenitic and non-magnetic

4XX—Chromium steels
NOTE: Hardenable, martensitic and magnetic.

4XX—Chromium steels
NOTE: Non-hardenable, ferritic and magnetic.

2.3 Modification Symbols. Modification to grades shall be indicated by a suffix letter, or letters, as follows:

L — denotes special low carbon content
S — denotes a lower specified maximum carbon
Ti — denotes material stabilized with titanium

Example of designation. AS 1449/316 Ti denotes a chromium-nickel austenitic stainless steel, not hardenable by heat-treatment and stabilized with titanium.

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

Plate — material 5 mm and over in thickness.
Sheet — material under 5 mm thick and over 500 mm wide.
Strip — material under 5 mm thick and up to and including 500 mm wide, produced by slitting sheet.

4 STEELMAKING PROCESS. The steel shall be made by an electric or other established process.

5 CONDITION OF STEEL ON DELIVERY.

5.1 General. Except for Grade AS 1449/301, the steel shall be supplied in the softened condition.

Grade AS 1449/301 shall be supplied in one of the following conditions:

softened, quarter-hard (¼H), half-hard (½H), three-quarter-hard (¾H), or hard (H).

5.2 Surface Finish. The surface finish for each side of the material shall be specified in terms of the following designations:

O — hot-rolled and softened but not descaled
S&D — hot-rolled, softened and descaled
2D — dull, cold-rolled
2B — cold-rolled finish brighter than 2D
BA — cold-rolled bright annealed finish
3 — polished finish
4 — general purpose polished finish.

NOTE: Some of these standard finishes may not be available on certain rolled products. Furthermore, material may be supplied with different standard surface finishes on its two faces although only certain combinations are possible (see Appendix C).

5.3 Edges. The material shall have sheared edges.

NOTE: When applied to cold-rolled sheet less than 500 mm wide (strip), the edge described above is known as a No 3 edge.

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 those in AS 1050 or AS K1.

6.2 Ladle Analysis. The ladle analysis of the steel shall comply with the limits given in Tables 1 to 3, as appropriate to the grade.

6.3 Residual Elements. Percentages of elements up to the following amounts shall be considered as incidental, if applicable:

Copper	0.35 percent maximum
Molybdenum	0.10 percent maximum
Nickel	0.35 percent maximum

6.4 Product Analysis. Individual determinations may vary from the specified ranges or limits to the extent shown in column 3 of Table 4, but the several determinations of a single element in any one ladle may not vary both above and below the specified range.

7 FREEDOM FROM DEFECTS. The steel shall be free from pipe, harmful segregation, surface flaws and other defects detrimental to its use for the applications defined in Clause 1.