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Australian Standard 1650—1981

GALVANIZED COATINGS

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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 Woolgrowers & Graziers Council

Australian Zinc Development Association

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Agriculture, Victoria

Electricity Supply Association of Australia

National Association of Australian State Road Authorities

National Farmers Federation

Railways of Australia Committee

Telecom Australia

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AUSTRALIAN STANDARD

GALVANIZED COATINGS

AS 1650—1981

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PREFACE

This edition of this standard was prepared under the direction of the Association's Committee on Zinc and Zinc Alloys by it subcommittee on galvanized coatings. It applies to the mass, quality and testing of the hot dip zinc coating on ferrous articles, in particular to sheet, hollow sections, wire, fasteners and general articles galvanized after fabrication. For completeness, nails have been included although they may not necessarily be coated by the hot dip process. No provision is made for defining the quality, properties or dimensional requirements of the iron or steel base.

This edition differs from the 1974 edition principally in respect of the following:

- The scope has been extended to include two classes of zinc coating on steel sheet.
- The test method for uniformity of coating (Preece Test) is now subject to negotiation.
- Requirements for determination of coating mass have been rationalized.
- Appendix A, Purchasing Guidelines, has been added to assist the purchaser in ordering to this standard.

It is now recognized, both in Australia and overseas, that the Preece Test has many drawbacks which make it highly suspect in a pass/fail situation. Because of inconsistencies associated with this test (see Paragraph A3.2 of Appendix A), the test method for uniformity of the coating is now subject to agreement between the purchaser and the supplier.

The inclusion of all test methods appropriate to hot dip galvanized coatings in Section 1 renders redundant AS K53, Methods for Testing Zinc Coating on Hot Dip Galvanized Articles, which is concurrently being withdrawn.

This standard requires reference to the following Australian and British standards:

AS 1204	Structural Steels—Ordinary Weldable Grades
AS 1397	Hot-dipped Zinc-coated or Aluminium/Zinc-coated Steel Sheet in Coil and Cut Lengths
AS 2331	Methods of Test for Metallic and Related Coatings 2331.1.3 Part 1—Local Thickness Tests—Magnetic Method 2331.2.1 Part 2—Average Thickness Tests—Dissolution Methods—Strip and Weigh, and Analytical 2331.2.3 Part 2—Average Thickness Tests—Hydrogen Evolution Method for Zinc Coatings
AS ....*	Methods for Bend Testing of Metals Part 1—Sheet, Strip and Plate
BS 443	Galvanized Coatings on Wire

*In course of preparation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
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GALVANIZED COATINGS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for the mass, quality and testing of the hot dip zinc (galvanized) coating on ferrous articles, as follows:

(a) Sheet (see Section 2).

(b) Hollow sections (circular and non-circular) (see Section 3).

(c) Wire of circular cross-section (see Section 4).

(d) Fasteners (nuts, bolts, washers) (see Section 5).

(e) General articles (forgings, castings, centrifuged work, wire products) (see Section 6).

NOTES:

1. For completeness, nails have been included in Section 6 although they may not necessarily be coated by the hot dip process.
2. Guidelines to purchasers on requirements that must be specified at the time of enquiry and/or order and those that must be agreed at the time of enquiry and/or order are given in Appendix A.

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

Coating mass—mass of the zinc coating per unit area expressed in grams per square metre (g/m^2).

NOTE: The mass of the coating for sheet is expressed as the total amount on both surfaces of the steel base.

Galvanized coating—a coating obtained by dipping prepared ferrous articles in molten zinc.

Galvanizer—a person, persons, or organization responsible for the coating of the article with molten zinc.

Supplier—a person, persons, or organization responsible for the supply of the galvanized product, and who shall be prepared to certify compliance with this standard.

1.3 BASIS METAL.

1.3.1 Holes for Filling, Venting or Draining. Where holes are to be drilled for filling, venting or draining, the drilling shall be carried out by the supplier in consultation with the galvanizer unless written consent for the galvanizer to carry out the work is given by the supplier (see also Appendix C).

1.3.2 Mechanical Properties. The galvanizer shall not be responsible for changes in the mechanical properties of the basis metal as a result of galvanizing, except where these changes can be shown to be due to faulty galvanizing processing.

NOTE: Recommended principles of design and preparation of materials prior to galvanizing are listed in Appendices C, D and E.

1.3.3 Distortion and Cracking. The galvanizer shall not be responsible for distortion or cracking, except where such defects can be shown to be due to faulty galvanizing processing (see Appendices D and E).

1.3.4 Embrittlement. The galvanizer shall not be responsible for embrittlement of work caused by strain-ageing of susceptible steel cold-worked during manufacture of the article, except where this can be shown to be due to faulty galvanizing processing (see Appendix E).

1.4 GALVANIZING PROCESS.

1.4.1 Pretreatment. The galvanizer shall not damage the article by over-pickling.

1.4.2 Hot Dip Galvanizing. The molten metal in the working area of the galvanizing bath shall contain not less than 98.5 percent by mass of zinc. Surplus zinc shall be removed from threads by centrifuging, brushing or similar process.

1.5 APPEARANCE. The coating shall be continuous, as smooth and evenly distributed as possible, and free from anything that is detrimental to the stated use of the coated article (see Appendices F and G).

NOTES:

1. A thicker, less smooth coating is obtained on job galvanized articles compared with continuously galvanized sheet or wire.
2. The coating on hot dip galvanized wire is not perfectly smooth or devoid of irregularities. Therefore it is intended that the diameter tolerances shown in the appropriate wire specifications be used in gauging the uniform areas of the galvanized wire.
3. For steels of certain composition and/or articles slowly cooled after galvanizing, the finish of the coated object may be partly or wholly grey. Provided that such a coating has adequate adhesion, the grey finish is not detrimental, although premature staining may occur in service.

1.6 TEST REQUIREMENTS.

1.6.1 Coating Mass. When determined in accordance with Appendix B, the coating mass shall comply with the requirements specified in Sections 2 to 6, as appropriate.

In cases of dispute, the gravimetric method described in Paragraph B2 of Appendix B shall be used as the referee test method, if practicable.

1.6.2 Adherence of Coating. When tested in accordance with Sections 2 to 6, as appropriate, the adherence of the coating shall comply with the requirements specified therein.

NOTE: For test for uniformity of the coating, see Paragraph A3.2 of Appendix A.

1.7 RETESTS. Should any samples first selected fail to comply with the requirements of this standard, twice the number of samples first selected or two further areas, as appropriate shall then be tested.

Should any one of these additional samples or areas fail, the batch or consignment represented by