AS 1214—1983

Australian Standard®

Hot–dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)

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This Australian standard was prepared by Committee ME/29, Fasteners. It was approved on behalf of the Council of the Standards Association of Australia on 9 November 1982 and published on 7 March 1983.

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

Australian Institute of Steel Construction Ltd

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Department of Defence

Electricity Supply Association of Australia

Fasteners Institute of Australia

Federal Chamber of Automotive Industries

Institution of Production Engineers

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This Standard was issued in draft form for comment as DR 82064.

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First published 1973
Second edition 1983

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 2825 7

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PREFACE

This edition of this standard was prepared by the Association's Committee on Fasteners, to supersede AS 1214–1973. When first published, the standard was intended to cover the anticipated needs of Australian industry under the metric system, for fasteners with ISO metric coarse pitch series threads. In the interests of international trade and international standardization, the standard at that time was fully aligned with international recommendations published by the International Organization for Standardization (ISO).

Since 1972 there have been major developments in international standards which now are at a stage where they need to be reflected in Australian standards. The ISO committee on fasteners (ISO/TC 2) has developed an oversize–tapping allowance for hot–dip galvanized nuts based on the requirements of ISO 1461, which is being adopted in international standards. This work was carried out by ISO/TC 2/WG 9 for which Australia holds the Secretariat, and agreement has now been reached on this aspect. The relevant oversize–tapping allowances are now included in all appropriate ISO fastener product standards and are in the process of being incorporated into the ISO screw thread system.

This edition of this standard has therefore been prepared with the aim of keeping Australian industry in the forefront of technical developments as they occur internationally, and incorporates the latest information available on the subject. The oversize–tapping allowances given are in agreement with those given in the international standards except for screw threads of M12 diameter. In this instance the diametral allowance has been increased in this standard from 350 μm, as given in the ISO standards, to 400 μm, as given in AS 1214—1973, to reduce the risk of interference between hot–dip galvanized bolt and mating nut on assembly.

The possibility of embrittlement occurring in fasteners due to severe cold working, over–pickling, etc, was considered by the committee and a warning note to this effect is given in Appendix C.

This standard has been based on and is in alignment with the following ISO standards:

ISO 1459	Metallic Coatings—Protection Against Corrosion by Hot Dip Galvanizing—Guiding Principles
ISO 1460	Metallic Coatings Hot Dip Galvanized Coatings on Ferrous Materials—Determination of the Mass per Unit Area—Gravimetric Method
ISO 1461	Metallic Coatings—Hot Dip Galvanized Coatings on Fabricated Ferrous Products—Requirements

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
HOT-DIP GALVANIZED COATINGS ON THREADED FASTENERS (ISO METRIC COARSE THREAD SERIES)

1 SCOPE. This standard specifies requirements for the mass, quality and testing of hot-dip galvanized coating on steel bolts, screws, nuts and other fasteners having ISO metric coarse threads, in the nominal size range M8 to M36 inclusive.

It deals with the purity of the galvanizing bath, the appearance of the coating under visual examination, the mass of the coating, the adhesion of the coating, and the test methods to be adopted. It also deals with the oversize tapped screw thread limits for internal threads, but does not deal with other dimensions, depending for these on reference to relevant specifications.

After galvanizing, fasteners must comply with the physical property requirements of their relevant specifications when tested in accordance with requirements specified therein.

NOTES:

1. The term 'relevant specification' refers to a specification covering the dimensions and physical properties of metric fasteners as required by the purchaser. This may be an Australian standard (e.g. AS 1110, 1111, 1112) or any other specification cited by the purchaser.
2. ISO metric coarse threads below M8 and all ISO metric fine pitch threads, generally cannot be successfully hot-dip galvanized without difficulty with regard to the assembly of bolt and nut.
3. This standard does not specify a requirement for uniformity of coating. Guidance is given in Appendix D.

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

AS 1110 ISO Metric Hexagon Precision Bolts and Screws

AS 1111 ISO Metric Hexagon Commercial Bolts and Screws

AS 1112 ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and Castle Nuts

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

Attention is called to the following standards which are also relevant:

AS 1275 Metric Screw Threads for Fasteners

AS 1650 Galvanized Coatings

AS 1721 General Purpose Metric Screw Threads

AS 2331 Methods of Test for Metallic and Related Coatings
- 2331.2.3 Part 2—Average Thickness Tests—Hydrogen Evolution Method for Zinc Coatings

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

3.1 Hot-dip galvanized coating—a coating obtained by dipping prepared steel articles in molten zinc.

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

4 PROCESS. Galvanizing shall be carried out by the hot-dip process, and the molten zinc in the galvanizing bath shall contain not less than 98.5 percent of zinc by mass. The temperature of the bath should not normally exceed 455°C but higher temperatures may be used provided that such temperatures do not impair the properties of the coating or the fastener.

In the galvanizing process, the fastener shall not be damaged by over-pickling.

Where fasteners are made from steel having a tensile strength so high as to introduce a risk of hydrogen embrittlement, i.e. property class 10.9* or higher, particular care shall be exercised in acid pickling or cathodic cleaning prior to galvanizing. Also, for cold-worked fasteners, the possibility of strain-age embrittlement must be considered. For further information, see Appendix C.

Surplus zinc shall be removed from threads by centrifuging, brushing or similar processes.

5 DIMENSIONS.

5.1 Fasteners with Internal Threads. Prior to galvanizing and subsequent tapping, the dimensions of fasteners with internal threads shall conform to their relevant specification (see Clause 1).

The threads shall be tapped after galvanizing to conform to the limits given in Table 1. The threads shall be oiled for corrosion protection.

5.2 Fasteners with External Threads. Prior to galvanizing, the dimensions of fasteners with external threads shall conform in all respects, including the thread sizes, to their relevant specification (see Clause 1).

The thickness and regularity of galvanized coating on external threads shall be so controlled in the galvanizing process that galvanized fasteners with external threads can be assembled by hand with internally threaded fasteners complying with Clause 5.1.

Galvanized external threads shall not be recut.

6 COATING.

6.1 Coating Mass. When determined in accordance with Appendix A, the coating mass shall conform to the limits given in Table 2.

* See AS 1110.

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