



Hot-dip galvanized steel bolts and associated nuts and washers for tower construction



This Australian Standard® was prepared by Committee ME-029, Fasteners. It was approved on behalf of the Council of Standards Australia on 18 January 2018. This Standard was published on 16 February 2018.

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 - Australian Chamber of Commerce and Industry
 - Australian Engineered Fasteners and Anchors Council
 - Australian Industry Group
 - Australian Steel Institute
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 - Galvanizers Association of Australia
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-

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

**Hot-dip galvanized steel bolts and
associated nuts and washers for tower
construction**

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PREFACE

This Standard was prepared by the Australian members of Standards Australia/Standards New Zealand Committee ME-029, Fasteners, to supersede AS/NZS 1559—1997, *Hot-dip galvanized steel bolts and associated nuts and washers for tower construction*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide designers and manufacturers with specifications for bolts, nuts and washers suitable for use in tower construction.

There are no ISO Standards for bolts for tower construction. IFI 541:1982, *Metric hex transmission tower bolts*, was used for guidance in the preparation of this Standard.

Bolts for tower construction have shorter thread lengths than specified in ISO 888:2012, *Fasteners—Bolts, screws and studs—Nominal lengths, and thread lengths*, to ensure that in a connection the shear planes will occur through the unthreaded shank. Other features are in accordance with the following ISO Standards:

ISO

272 Fasteners—Hexagon products—Widths across flats

885 General purpose bolts and screws—Metric series—Radii under the head

4759 Tolerances for fasteners

4759.1 Part 1: Bolts, screws, studs and nuts—Product grades A, B and C

The mechanical properties specified for tower bolts include appropriate shear strength and impact strength requirements suitable for the application.

Changes introduced in this edition of the Standard include the following:

- (a) Introduction of provisions for spring washers developed from the withdrawn Standard, AS 1968—1976, *Helical spring lock washers (metric series)*.
- (b) Marking for bolts and nuts has been changed to be consistent with ISO marking requirements.
- (c) A new section covering the requirements for identification and testing has been included.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ are used in a Standard to define the application of the appendices or annexes to which they apply. A ‘normative’ appendix or annex is an integral part of a Standard, whereas an ‘informative’ appendix or annex is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the requirements for hot-dip galvanized bolts, including step bolts, with ISO metric coarse pitch series threads for normal and low temperature applications in tower construction, and associated nuts and washers. Nominal bolt sizes and lengths are as follows:

- (a) Single-nut type tower bolts in diameters from 12 mm to 30 mm inclusive, with lengths from 35 mm to 160 mm inclusive.
- (b) Double-nut type tower bolts in diameters from 12 mm to 30 mm inclusive, with lengths from 50 mm to 125 mm inclusive.
- (c) Step bolts 16 mm, 20 mm, and 24 mm in diameter with lengths from 180 mm to 290 mm inclusive.

NOTE: Tower bolts have a thread length/bolt length relationship to enable threads to be excluded from shear planes when assembled.

This Standard uses the terminology 'bolt' to mean both tower bolts and step bolts. Where the terminology used is 'tower bolt' or 'step bolt', the reference only applies to tower bolts or step bolts, respectively (see Clause 1.4).

1.2 APPLICATION

Bolts, nuts and washers shall conform to the requirements of Section 1 and with the following sections as applicable:

- (a) Bolts..... Section 2.
- (b) Nuts..... Section 3.
- (c) Flat washers..... Section 4.
- (d) Helical spring washers..... Section 5.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1112 | ISO metric hexagon nuts |
| 1112.1 | Part 1: Style 1—Product grades A and B |
| 1275 | Metric screw threads for fasteners |
| 1391 | Metallic materials—Tensile testing at ambient temperature |
| 1442 | Carbon steels and carbon-manganese steels—Hot rolled bars and semi-finished products |