

Australian/New Zealand Standard®

**High-strength steel bolts with
associated nuts and washers for
structural engineering**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME/29, Fasteners. It was approved on behalf of the Council of Standards Australia on 2 April 1996 and on behalf of the Council of Standards New Zealand on 11 March 1996. It was published on 5 October 1996.

The following interests are represented on Committee ME/29:

Australian Chamber of Commerce and Industry
Bureau of Steel Manufacturers of Australia
Electricity Supply Association of Australia
Fasteners Institute of Australia
Federal Chamber of Automotive Industries Australia
Metal Building Products Manufacturers Association Australia
Metal Trades Industry Association of Australia
New Zealand Manufacturers Federation

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**High-strength steel bolts with
associated nuts and washers for
structural engineering**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME/29 on Fasteners to supersede AS 1252—1983, *High strength steel bolts with associated nuts and washers for structural engineering*.

Major technical changes incorporated in this edition relate to the mechanical properties and testing requirements in order to align with the relevant ISO requirements. Other changes include the following:

- (a) Updating of reference documents.
- (b) Inclusion of a reference to SAA [HB18.22](#)/SANZ HB18.22 in relation to a manufacturer's declaration of conformity. The Handbook contains a definition of manufacturer and includes an example of a declaration of conformity which may be provided to a customer.
- (c) Revision of dimensions to align with ISO requirements.
- (d) Replacement of detailed requirements for materials, mechanical properties and test procedures with reference to separate Standards.
- (e) Modification of hardness requirements for hot-dip galvanized washers.
- (f) Editorial changes in accordance with current policy.

The identification marking on a fastener may now include that of a distributor or importer, this being a departure from the previously accepted practice of the marking being that of the fabricator of the product.

This Standard is based on and, except for the marking requirements for the nuts and bolts, is technically equivalent to the following ISO Standards for the relevant property class:

ISO

- 4775:1984 Hexagon nuts for high-strength structural bolting with large width across flats—Product grade B—Property classes 8 and 10
- 7411:1984 Hexagon bolts for high-strength structural bolting with large width across flats (thread lengths according to ISO 888)—Product grade C—Property classes 8.8 and 10.9
- 7415:1984 Plain washers for high-strength structural bolting, hardened and tempered

The dimensions of M12 products have not been included because the demand for this size is small.

The marking requirements given in AS 1252—1983 have been retained because the use of the letter 'S' used in conjunction with the property class symbol could be confused with the snug tight bolting category 8.8/S given in AS 4100—1990, *Steel structures*.

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

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

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Originated in Australia as AS B157 — 1960.
 Previous edition in Australia AS 1252 — 1983.
 Jointly revised and designated AS/NZS 1252:1996.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**High-strength steel bolts with associated nuts and washers for structural engineering**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies the dimensional, material and marking requirements for steel bolts of property class 8.8 and steel nuts of property class 8 with ISO metric coarse pitch series threads in diameters from 16 mm to 36 mm and associated hardened and tempered steel washers intended for use in steel structures.

1.2 APPLICATION Bolts, nuts and washers shall comply with the requirements of Section 1 and the following Sections as applicable:

- (a) Bolts Section 2.
- (b) Nuts Section 3.
- (c) Washers Section 4.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1014	Gauging of metric screw threads
1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
1275	Metric screw threads for fasteners
1650	Hot-dipped galvanized coatings on ferrous articles
1789	Electroplated coatings—Zinc on iron or steel
1815	Metallic materials—Rockwell hardness test
1817	Metallic materials—Vickers hardness test
1897	Electroplated coatings on threaded components (metric coarse series)

AS/NZS

4291	Mechanical properties of fasteners
4291.1	Part 1: Bolts, screws and studs
4291.2	Part 2: Nuts with specified proof load values — Coarse thread

SAA/SNZ

HB18	Guidelines for third-party certification and accreditation
HB18.22	Guide 22: Information on manufacturers' declaration of conformity with standards or other technical specifications

ISO

6157	Fasteners—Surface discontinuities
6157.1	Part 1: Bolts, screws and studs for general requirements

SAE

J122a	Surface discontinuities on nuts
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1.4 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.4.1 Concentricity tolerance—of a bolt, is the allowable deviation of the shank with respect to the pitch diameter of the screw thread.

1.4.2 Grip length (l_g)—of a bolt, is the minimum thickness of materials which can be clamped.

1.4.3 May—indicates the existence of an option.

1.4.4 Nominal length (l)—of a bolt, is the distance from the bearing surface of the head to the extreme end.

1.4.5 Shall—indicates that a statement is mandatory.

1.4.6 Should—indicates a recommendation.

1.4.7 Symmetry tolerance

1.4.7.1 Of a bolt—the allowable deviation of the across-flats dimension with respect to the shank or the pitch diameter of the screw thread.

1.4.7.2 Of a nut—the allowable deviation of the across-flats dimension with respect to the pitch diameter of the screw thread.

1.4.8 Thread length (b)—of a bolt, is the difference between the nominal length of the bolt and the distance between the bearing surface of the head and the nearest face of a 6g GO screw ring gauge, screwed as far as practicable on to the bolt by hand.

1.4.9 Thread runout

1.4.9.1 Bolts with rolled threads—the distance from the top of the extrusion angle to the nearest face of a 6g GO screw ring gauge, screwed on as far as practicable by hand.

1.4.9.2 Bolts with cut threads—the distance from the last witness of thread to the nearest face of a 6g GO screw ring gauge, screwed on as far as practicable by hand.

1.4.10 Transition diameter (d_a)—the diameter of a circle formed at the transition between the fillet radius and the bearing surface of the head.

1.4.11 Unthreaded shank length (l_s)—of a bolt, is the distance from the bearing surface of the bolt head to the last scratch of thread, or top of the extrusion angle, whichever is closer to the head.

1.5 MARKING (see Figure 1.1)

1.5.1 Bolts High-strength steel bolts shall be marked with the following information:

- (a) The property class symbol with or without the separating point embossed or indented on top of the head or indented or rolled into one of the hexagon flats.
- (b) Three radial lines approximately 120 degrees apart embossed or indented on top of the head.
- (c) The trade (identification) mark of the manufacturer embossed or indented on top of the head.

1.5.2 Nuts High-strength steel nuts shall be marked with the following information:

- (a) The property class symbol indented or rolled into a hexagon flat or the bearing surface, or embossed or indented on the external chamfer.
- (b) Three circumferential arcs approximately 120 degrees apart embossed or indented on the non-bearing face, or for double-chamfered nuts, indented on one or both bearing faces.
- (c) The trade (identification) mark of the manufacturer embossed or indented on an external chamfer or indented on the bearing face.

1.5.3 Washers Flat round washers for use with high-strength steel bolts and nuts for structural engineering shall be identified by the provision of three nibs as shown in Figure 1.1(c).

NOTES:

- 1 Manufacturers making a statement of compliance with this Australian Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.
- 2 Guidance on the manufacturer's declaration of conformity with this Standard is given in SAA HB18.22/SANZ HB18.22.

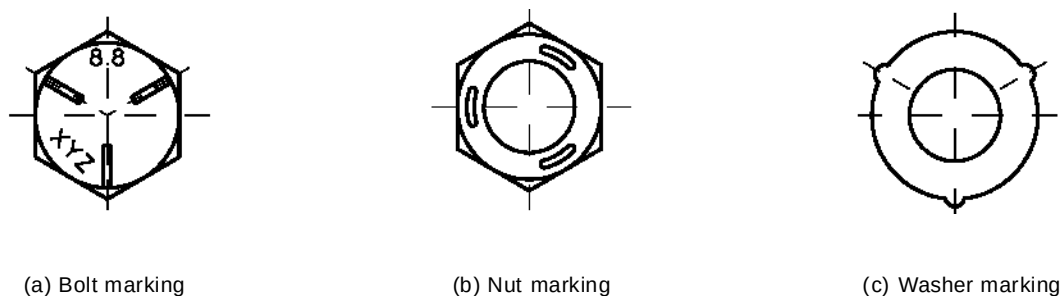


FIGURE 1.1 IDENTIFICATION MARKING

1.6 DESIGNATION

1.6.1 Bolts The designation of high-strength steel bolts for structural engineering shall be composed of the following:

- (a) General product description.
- (b) The number of this Joint Australian/New Zealand Standard, i.e. AS/NZS 1252.
- (c) The letter 'M' indicating that the product has a metric coarse pitch series thread followed by the nominal size (thread diameter), in millimetres.
- (d) The nominal length, in millimetres.
- (e) The property class symbol.
- (f) The coating, where applicable in accordance with the appropriate Standard.
- (g) Any other features.

Example:

Hot-dip galvanized high-strength steel bolts, 20 mm diameter and 100 mm long are designated—

High-strength steel bolts for structural engineering to AS/NZS 1252—M20 × 100—8.8 (hot dip galvanized to AS 1214).

1.6.2 Nuts The designation of high-strength steel nuts for structural engineering shall be composed of the following:

- (a) General product description.
- (b) The number of this Joint Australian/New Zealand Standard, i.e. AS/NZS 1252.
- (c) The letter 'M' indicating that the product has a metric coarse pitch series thread followed by the nominal size (thread diameter), in millimetres.

- (d) The property class symbol.
- (e) The coating, where applicable, in accordance with the appropriate Standard.
- (f) Any other features.

Example:

Uncoated high-strength steel nuts with 20 mm threads are designated—

High strength steel nuts for structural engineering to AS/NZS 1252—M20—8.

1.6.3 Washers The designation of hardened and tempered washers for structural bolting shall be composed of the following:

- (a) General product description.
- (b) The number of the Joint Australian/New Zealand Standard, i.e. AS/NZS 1252.
- (c) The nominal size (nominal bolt diameter), in millimetres.
- (d) The coating, where applicable, in accordance with the appropriate Standard.
- (e) Any other features.

Example:

20 mm hot-dip galvanized hardened and tempered steel washers for structural engineering are designated—

Steel washers for structural bolting to AS/NZS 1252—20 (hot-dip galvanized to AS 1650).

NOTE: Bolts, nuts and washers may be supplied as assemblies.