



**Mechanical properties of fasteners
made of carbon steel and alloy steel**

Part 1: Bolts, screws and studs



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Australian Standard[®]

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PREFACE

This Standard was prepared by the Standards Australia Committee ME-029, Fasteners, to supersede AS 4291.1—2000.

The objective of this Standard is to provide manufacturers and users of threaded fasteners with material requirements and specifications for the mechanical properties of carbon steel and alloy steel bolts, screws and studs with ISO metric threads.

This Standard is identical with, and has been reproduced from ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel, Part 1: Bolts, screws and studs with specified property classes—Coarse thread and fine pitch thread*.

As this Standard is reproduced from an International Standard, the following applies:

- (a) In the source text ‘this part of ISO 898’ should read ‘this Australian Standard’.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
ISO 261	ISO general purpose metric screw threads—General plan	AS 1721	General purpose metric screw threads
898	Mechanical properties of fasteners made of carbon steel and alloy steel	AS/NZS 4291	Mechanical properties of fasteners
898-2	Part 2: Nuts with specified property classes—Coarse thread and fine pitch thread	4291.2	Part 2: Nuts with specified proof load values—Coarse thread
898-5	Part 5: Set screws and similar threaded fasteners with specified hardness classes—Coarse thread and fine pitch thread	AS 4291.5	Mechanical properties of fasteners made of carbon steel and alloy steel Part 5: Set screws and similar threaded fasteners not under tensile stresses
898-7	Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm	4291.7	Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm
965	ISO general purpose metric screw threads—Tolerances		
965-1	Part 1: Principles and basic data	1721	General purpose metric screw threads
965-2	Part 2: Limits of sizes for general purpose external and internal screw threads—Medium quality	1721	General purpose metric screw threads
10684	Fasteners—Hot dip galvanized coatings	1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

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

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AUSTRALIAN STANDARD

Mechanical properties of fasteners made of carbon steel and alloy steel**Part 1:
Bolts, screws and studs****1 Scope**

This part of ISO 898 specifies mechanical and physical properties of bolts, screws and studs made of carbon steel and alloy steel when tested at an ambient temperature range of 10 °C to 35 °C. Fasteners (the term used when bolts, screws and studs are considered all together) that conform to the requirements of this part of ISO 898 are evaluated at that ambient temperature range. They might not retain the specified mechanical and physical properties at elevated temperatures (see Annex B) and/or lower temperatures.

NOTE 1 Fasteners conforming to the requirements of this part of ISO 898 are used in applications ranging from -50 °C to +150 °C. Users are advised to consult an experienced fastener metallurgist for temperatures outside the range of -50 °C to +150 °C and up to a maximum temperature of +300 °C when determining appropriate choices for a given application.

NOTE 2 Information for the selection and application of steels for use at lower and elevated temperatures is given, for example, in EN 10269, ASTM F2281 and in ASTM A320/A320M.

Certain bolts and screws might not fulfil the tensile or torsional requirements of this part of ISO 898 because the geometry of their heads reduces the shear area in the head compared to the stress area in the thread. These include bolts and screws having a low or countersunk head (see 8.2).

This part of ISO 898 is applicable to bolts, screws and studs

- made of carbon steel or alloy steel,
- having triangular ISO metric screw thread in accordance with ISO 68-1,
- with coarse pitch thread M1, to M39, and fine pitch thread M8×1 to M39×3,
- with diameter/pitch combinations in accordance with ISO 261 and ISO 262, and
- having thread tolerances in accordance with ISO 965-1, ISO 965-2 and ISO 965-4.

It is not applicable to set screws and similar threaded fasteners not under tensile stress (see ISO 898-5).

It does not specify requirements for such properties as

- weldability,
- corrosion resistance,
- resistance to shear stress,