

INTERNATIONAL STANDARD

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Mechanical properties of fasteners —

Part 6:

Nuts with specified proof load values — Fine
pitch thread

Caractéristiques mécaniques des éléments de fixation —

Partie 6: Écrous avec charges d'épreuve spécifiées — Filetage à pas fin



Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 898-6 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 1, *Mechanical properties of fasteners*.

This second edition cancels and replaces the first edition (ISO 898-6:1988), which has been technically revised.

ISO 898 consists of the following parts, under the general title *Mechanical properties of fasteners*:

- *Part 1: Bolts, screws and studs*
- *Part 2: Nuts with specified proof load values — Coarse thread*
- *Part 5: Set screws and similar threaded fasteners not under tensile stresses*
- *Part 6: Nuts with specified proof load values — Fine pitch thread*
- *Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm*

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Mechanical properties of fasteners —

Part 6:

Nuts with specified proof load values — Fine pitch thread

1 Scope

This part of ISO 898 specifies the mechanical properties of nuts with specified proof load values when tested at an ambient temperature range of + 10 °C to + 35 °C. Mechanical and physical properties will vary with respect to temperature and property class.

Products conforming to the requirements of this part of ISO 898 are evaluated only at the ambient temperature range and may not retain the specified physical properties at higher and lower temperatures.

At temperatures higher or lower than the ambient temperature range, a significant change in properties may occur. When fasteners are to be used above or below the ambient temperature range, it is the responsibility of the user to ensure that the mechanical and physical properties are suitable for his particular service conditions.

This part of ISO 898 applies to nuts

- with nominal thread diameters, d , from 8 mm up to and including 39 mm (fine pitch thread);
- of triangular ISO thread and with diameters and pitches in accordance with ISO 68 and ISO 262 (fine pitch thread);
- with diameter/pitch combinations in accordance with ISO 261 (fine pitch thread);

- with thread tolerances 6H in accordance with ISO 965-1 and 965-2 (see note 2);
- with specific mechanical requirements;
- with widths across flats as specified in ISO 272;
- with nominal heights greater than or equal to $0,5d^{1)}$;
- made of carbon steel or alloy steel (see note 1).

It does not apply to nuts requiring special properties such as

- weldability;
- prevailing torque performance (see ISO 2320);
- corrosion resistance (see ISO 3506);
- ability to withstand temperatures above + 300 °C or below – 50 °C. (However, see note 1.)

NOTES

1 Nuts made from free-cutting steel should not be used above + 250 °C.

2 With thread tolerances other or larger than 6H, a decrease in the stripping strength should be considered (see table 1).

1) In ISO 898:1988, the symbol D was used.

Table 1 — Reduction in thread strength

Nominal thread diameter d mm	Test load, %		
	Thread tolerances		
	6H	7H	6G
$8 \leq d \leq 16$	100	96	97,5
$16 < d \leq 39$	100	98	98,5

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 898. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 898 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 68:1973, *ISO general purpose screw threads — Basic profile*.

ISO 261:1973, *ISO general purpose metric screw threads — General plan*.

ISO 262:1973, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*.

ISO 272:1982, *Fasteners — Hexagon products — Widths across flats*.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*.

ISO 724:1993, *ISO general-purpose metric screw threads — Basic dimensions*.

ISO 898-2:1992, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread*.

ISO 965-1:1980, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*.

ISO 965-2:1980, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose bolt and nut threads — Medium quality*.

ISO 4964:1984, *Steel — Hardness conversions*.

ISO 6157-2:—²⁾, *Fasteners — Surface discontinuities — Part 2: Nuts with threads M5 to M39*.

ISO 6506:1981, *Metallic materials — Hardness test — Brinell test*.

ISO 6507-1:1982, *Metallic materials — Hardness test — Vickers test — Part 1: HV 5 to HV 100*.

ISO 6508:1986, *Metallic materials — Hardness test — Rockwell test (scales A - B - C - D - E - F - G - H - K)*.

3 Designation system

3.1 Nuts with nominal heights $\geq 0,8d$ (effective lengths of thread $\geq 0,6d$): Nuts of style 1 and style 2

Nuts with nominal heights $\geq 0,8d$ (effective lengths of thread $\geq 0,6d$) are designated by a number to indicate the maximum appropriate property class of bolts with which they may be mated.

Failure of threaded fasteners due to over-tightening can occur by bolt shank fracture or by stripping of the threads of the nut and/or bolt. Shank fracture is sudden and therefore easily noticed. Stripping is gradual and therefore difficult to detect and this introduces the danger of partly failed fasteners being left in assemblies.

It would therefore be desirable to design threaded connections so that their mode of failure would always be by shank fracture but, unfortunately, because of the many variables which govern stripping strength (nut and bolt material strengths, thread clearances, across-flats dimensions, etc.), nuts would have to be excessively thick to guarantee this mode in all cases.

A bolt or screw of thread diameter 8 mm to 39 mm assembled with a nut of the appropriate property class, in accordance with table 2, is intended to provide an assembly capable of being tightened to the bolt proof load without thread stripping occurring.

2) To be published.