



SLOVENSKI STANDARD
SIST EN ISO 2320:2001
01-julij-2001

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Prevailing torque type steel hexagon nuts - Mechanical and performance requirements
(ISO 2320:1997)

Sechskantmuttern aus Stahl mit Klemmteil - Mechanische und funktionelle
Eigenschaften (ISO 2320:1997)

Ecrous hexagonaux autofreinés en acier - Caractéristiques mécaniques et performances
(ISO 2320:1997)

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Ta slovenski standard je istoveten z: EN ISO 2320:1997

ICS:

21.060.20 Matice Nuts

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 2320

November 1997

ICS 21.060

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English version

Prevailing torque type steel hexagon nuts - Mechanical and performance requirements (ISO 2320:1997)

Ecrous hexagonaux autofreinés en acier - Caractéristiques mécaniques et performances (ISO 2320:1997)

Sechskantmuttern aus Stahl mit Klemmteil - Mechanische und funktionelle Eigenschaften (ISO 2320:1997)

This European Standard was approved by CEN on 23 October 1997.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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EN ISO 2320:1997

Foreword

The text of the International Standard ISO 2320:1997 has been prepared by Technical Committee ISO/TC 2 "Fasteners" in collaboration with Technical Committee CEN/TC 185 "Threaded and non-threaded mechanical fasteners and accessories", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 1998, and conflicting national standards shall be withdrawn at the latest by May 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 2320:1997 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

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Annex ZA (normative)
Normative references to international publications
with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 898-1	1988	Mechanical properties of fasteners - Part 1: Bolts, screws and studs	EN 20898-1	1991
ISO 898-2	1992	Mechanical properties of fasteners - Part 2: Nuts with specified proof load values - Coarse thread	EN 20898-2	1993
ISO 898-6	1994	Mechanical properties of fasteners - Part 6: Nuts with specified proof load values - Fine pitch thread	EN ISO 898-6	1995

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**Prevailing torque type steel hexagon
nuts — Mechanical and performance
properties**

Écrous hexagonaux autofreinés en acier — Caractéristiques mécaniques et performances

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ISO 2320:1997(E)**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.

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International Standard ISO 2320 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 1, *Mechanical properties of fasteners*.

[SIST EN ISO 2320:2001](#)

This third edition cancels and replaces the second edition (ISO 2320:1983), which has been technically revised.

Annexes A and B form an integral part of this International Standard. Annex C is for information only.

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Prevailing torque type steel hexagon nuts – Mechanical and performance properties

1 Scope

This International Standard specifies the mechanical and performance properties for prevailing torque type steel hexagon nuts (including those with flange) when tested over an ambient temperature range of 10 °C to 35 °C. Properties will vary at higher and lower temperature.

It applies to prevailing torque type nuts

- with nominal thread diameters up to and including 39 mm;
- of triangular ISO thread according to ISO 68;
- with diameter/pitch combinations according to ISO 261;
- with thread tolerances 6H according to ISO 965-2;
- with specific mechanical requirements;
- with dimensions as specified in product standards provided they make reference to this International Standard;
- within the temperature range –50 °C to +300 °C for all metal type nuts;
- within the temperature range –50 °C to +120 °C for non-metallic insert type nuts¹⁾.

It does not apply to nuts requiring special properties which may require special materials or coatings to improve

- weldability;
- corrosion resistance;
- performance outside the above specified temperature ranges.

Prevailing torque performance decreases with increasing re-use. The nut user should consider the implications of decreased performance prior to re-use.

NOTE — Information on torque/clamping force performance requirements and testing are given in the annex C. These functional requirements and the accompanying test procedure are still under discussion and cannot be specified mandatorily for the time being.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 68-1 : –²⁾, *ISO general purpose screw threads – Basic profile – Part 1: Metric screw threads.*

ISO 261 : –³⁾, *ISO general purpose metric threads – General plan.*

1) By careful choice of non-metallic materials higher service temperature properties can be attained by agreement between user and manufacturer.

2) To be published. (Revision of ISO 68:1973)

3) To be published. (Revision of ISO 261:1973)

ISO 898-1:–⁴⁾, *Mechanical properties of fasteners made of carbon steel and alloy steel – Part 1: Bolts, screws and studs.*

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

ISO 898-6:1994, *Mechanical properties of fasteners – Part 6: Nuts with specified proof load values – Fine pitch thread.*

ISO 965-2:–⁵⁾, *ISO general purpose metric screw threads – Tolerances – Part 2: Limits of sizes for general purpose bolt and nut threads – Medium quality.*

ISO 4042:–⁶⁾, *Fasteners – Electroplated castings.*

ISO 4753:–⁷⁾, *Fasteners – End of parts with external metric ISO thread.*

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

ISO 6507-1:–⁸⁾, *Metallic materials – Vickers hardness test – Part 1: Test method.*

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

3 Definitions

For the purposes of this International Standard the following definitions apply.

3.1 prevailing torque type nut: Nut which is not free-running on a mating thread by virtue of a self-contained prevailing torque feature, and which provides a degree of resistance to rotation independent of clamping or compression forces.

3.2 prevailing torque developed by a nut: Torque necessary to rotate the nut on its mating, externally threaded component and with no axial load in the mating component.

4 Designation system

The property classes specified for prevailing torque type nuts are the same as specified in ISO 898-2 and ISO 898-6 for hexagon nuts, namely

– nuts with nominal heights $\geq 0,8 d$ (effective lengths of thread $\geq 0,6 d$) are designated by a number to indicate the maximum appropriate property class of bolts with which they may be mated, see table 1;

– nuts with nominal heights $\geq 0,5 d$ and $< 0,8 d$ (effective height of thread $\geq 0,4 d$ and $< 0,6 d$) are designated by a combination of two numbers: the second indicates the nominal stress under proof load on a hardened test mandrel, while the first indicates that the loadability of a bolt-nut assembly is reduced in comparison with the loadability on a hardened test mandrel and also in comparison with a bolt-nut assembly described in table 1. Table 2 gives the designation system and the stresses under proof load of these nuts.

4) To be published. (Revision of ISO 898-1:1988)

5) To be published. (Revision of ISO 965-2:1980)

6) To be published. (Revision of ISO 4042:1989)

7) To be published. (Revision of ISO 4753:1983)

8) To be published. (Revision of ISO 6507-1:1982; ISO 6507-2:1983; ISO 6507-3:1989; ISO 409-1:1982; ISO 409-2:1983 and ISO/DIS 409-3)

Table 1 — Designation system for nuts with nominal heights $\geq 0,8 d$

Property class of the nut	Coarse thread	5	6	8	9	10	12
	Fine pitch thread	—	6	8	—	10	12
Property class of the mating bolt or screw		≤ 5.8	≤ 6.8	≤ 8.8	9.8 ≤ 8.8	10.9 9.8 8.8	12.9 10.9 8.8

NOTE — In general, nuts of a higher property class can replace nuts of lower property class. However it is not recommended that a heat-treated all-metal nut be combined with a bolt of lower property class.

Table 2 — Designation system and stresses under proof load for nuts with nominal heights $\geq 0,5 d$ and $< 0,8 d$

Property class of nut	Nominal stress under proof load	Actual stress under proof load
	N/mm ²	N/mm ²
04	400	380
05	500	500

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5 Materials and processes

5.1 Materials

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Nuts shall be made of steel conforming to the chemical composition limits specified in table 3. The prevailing torque element of insert-type nuts may be made of a material other than steel. It is recommended that users and manufacturers consider the maximum limits for sulphur, manganese, boron and other intentionally added elements which may result in component failure, when in excessive amounts.

Table 3 — Limits of chemical composition

Property class		Chemical composition limit (check analysis), %			
Coarse thread	Fine pitch thread	C max.	Mn min.	P max.	S min.
5 ¹⁾ ; 6 ¹⁾	6	0,50	—	0,060	0,150
8; 9; 04 ¹⁾	8	0,58	0,25	0,060	0,150
10 ²⁾ ; 05 ²⁾	10 ²⁾	0,58	0,30	0,048	0,058
12 ²⁾	12 ²⁾	0,58	0,45	0,048	0,058

1) Nuts may be manufactured from free cutting steel, unless otherwise agreed between the user and the manufacturer. In such cases the following maximum sulfur, phosphorus and lead contents are permissible:
S 0,34 %, P 0,11 % and Pb 0,35 %.

2) Alloying elements may be added if necessary to develop the mechanical properties of the nuts.