INTERNATIONAL STANDARD

**ISO 12125**

Second edition
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# Prevailing torque type hexagon nuts with flange (with non-metallic insert) with metric fine pitch thread, style 2 — Product grades A and B

*Écrous hexagonaux à embase, autofreinés (à anneau non métallique), à filetage métrique à pas fin, style 2 — Grades A et B*

Reference number
ISO 12125:2012(E)

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# Contents

Page

# 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.

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The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12125 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 12, *Fasteners with metric internal thread*.

This second edition cancels and replaces the first edition (ISO 12125:1997), of which it constitutes a minor revision.

# Prevailing torque type hexagon nuts with flange (with non-metallic insert) with metric fine pitch thread, style 2 — Product grades A and B

## 1 Scope

This International Standard specifies the characteristics of prevailing torque type all metal hexagon nuts with flange (with non-metallic insert) of style 2, with metric fine pitch thread with nominal thread diameters, $D$, from 8 mm up to and including 20 mm, in product grade A for sizes $D \leq 16$ mm and product grade B for sizes $D > 16$ mm, and with property classes 6, 8 and 10.

NOTE The dimensions of the nuts correspond to those given in ISO 10663 plus prevailing torque feature.

If other specifications are required, they can be selected from existing International Standards, for example ISO 261, ISO 724, ISO 898-2, ISO 965-2, ISO 2320 and ISO 4759-1.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

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

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

ISO 898-2, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 2: Nuts with specified property classes – Coarse thread and fine pitch thread*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads – Medium quality*

ISO 2320, *Prevailing torque type steel nuts — Mechanical and performance properties*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts – Product grades A, B and C*

ISO 6157-2, *Fasteners — Surface discontinuities — Part 2: Nuts*

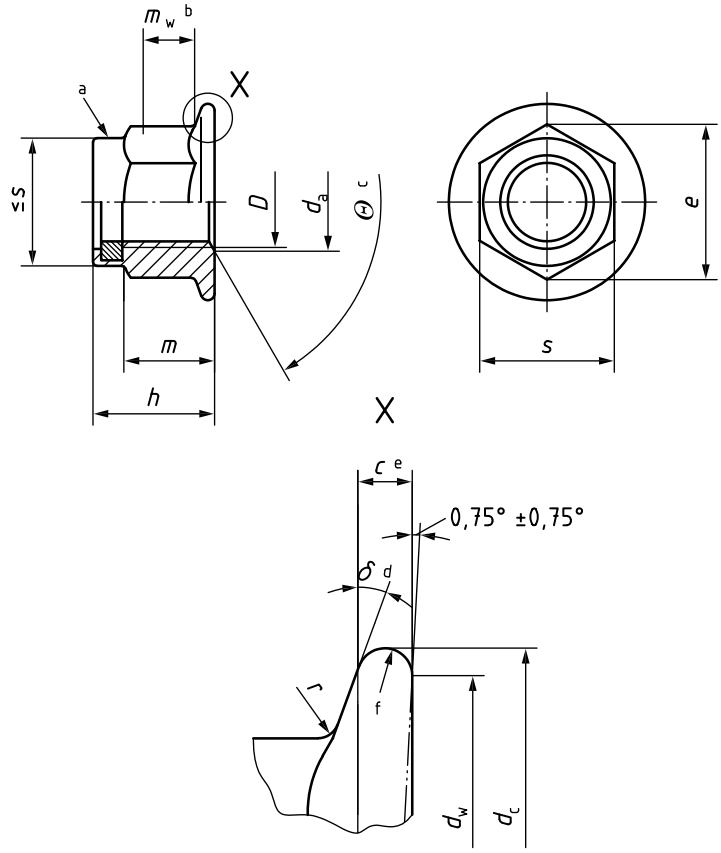
ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

## 3 Dimensions

See Figure 1 and Table 1.

Symbols and descriptions of dimensions are specified in ISO 225.




a Prevailing torque element, shape is at the discretion of the manufacturer.

b $m_w$ is the wrenching height; see the note to Table 1.

c $\theta = 90°$ to 120°.

d $\delta = 15°$ to 25°.

e $c$ is measured at $d_{w,min}$.

f Contour of the edge is at the discretion of the manufacturer.

**Figure 1**

**Table 1 — Dimensions**

Dimensions in millimetres

| **Thread** ($D \times P$[a]) | | **M8 × 1** | **M10 × 1** (**M10 × 1,25**)[b] | **M12 × 1,5** (**M12 × 1,25**)[b] | **(M14 × 1,5)**[b] | **M16 × 1,5** | **M20 × 1,5** |
|---|---|---|---|---|---|---|---|
| $c$ | | 1,2 | 1,5 | 1,8 | 2,1 | 2,4 | 3,0 |
| $d_a$ | max. | 8,75 | 10,80 | 13,00 | 15,10 | 17,30 | 21,60 |
| | min. | 8,00 | 10,00 | 12,00 | 14,00 | 16,00 | 20,00 |
| $d_c$ | max. | 17,9 | 21,8 | 26,0 | 29,9 | 34,5 | 42,8 |
| $d_w$ | min. | 15,8 | 19,6 | 23,8 | 27,6 | 31,9 | 39,9 |
| $e$ | min. | 14,38 | 16,64 | 20,03 | 23,36 | 26,75 | 32,95 |
| $h$ | max. | 11,10 | 13,50 | 16,10 | 18,20 | 20,30 | 24,80 |
| | min. | 8,74 | 10,30 | 12,57 | 14,80 | 17,20 | 20,30 |
| $m$[c] | min. | 7,64 | 9,64 | 11,57 | 13,30 | 15,30 | 18,70 |
| $m_w$ | min. | 4,6 | 5,6 | 6,8 | 7,7 | 8,9 | 10,7 |
| $s$ | max. | 13,00 | 15,00 | 18,00 | 21,00 | 24,00 | 30,00 |
| | min. | 12,73 | 14,73 | 17,73 | 20,67 | 23,67 | 29,16 |
| $r$[d] | max. | 0,5 | 0,6 | 0,7 | 0,9 | 1,0 | 1,2 |

NOTE If the product passes the gauging given in Annex A, the requirements for dimensions $e$, $c$ and $m_w$ are satisfied.

[a] $P$ is the pitch of the thread.

[b] The size in parentheses should be avoided if possible.

[c] Minimum thread height.

[d] Radius, $r$, applies both at the corners and the flats of the hexagon.

## 4 Requirements and reference International Standards

See Table 2.

**Table 2 — Requirements and reference International Standards**

| | | |
|---|---|---|
| **Material** | Nut body | Steel |
| | Insert | For example, polyamide |
| **General requirements** | International Standard | ISO 8992 |
| **Thread** | Tolerance class | 6H |
| | International Standards | ISO 261, ISO 724, ISO 965-2 |
| **Mechanical and performance properties** | Property class | 6, 8, 10 |
| | International Standards | ISO 898-2, ISO 2320 |
| **Tolerance** | Product grade | For $D \leq$ 16 mm: A<br>For $D >$ 16 mm: B |
| | International Standard | ISO 4759-1 |
| **Finish — Coating** | | As processed<br>Requirements for electroplating are specified in ISO 4042.<br>Requirements for non-electrolytically applied zinc flake coatings are specified in ISO 10683.<br>Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser. |
| **Surface integrity** | | Limits for surface discontinuities are specified in ISO 6157-2. |
| **Acceptability** | | Acceptance inspection is specified in ISO 3269. |

## 5 Designation

EXAMPLE A prevailing torque type hexagon nut with flange, with non-metallic insert, thread M12 × 1,5 and property class 8 is designated as follows:

**Prevailing torque type hexagon nut with flange ISO 12125 - M12 × 1,5 - 8**

# Annex A
(informative)

# Gauging of hexagon nuts with flange

## A.1 Recommended method for gauging of hexagon

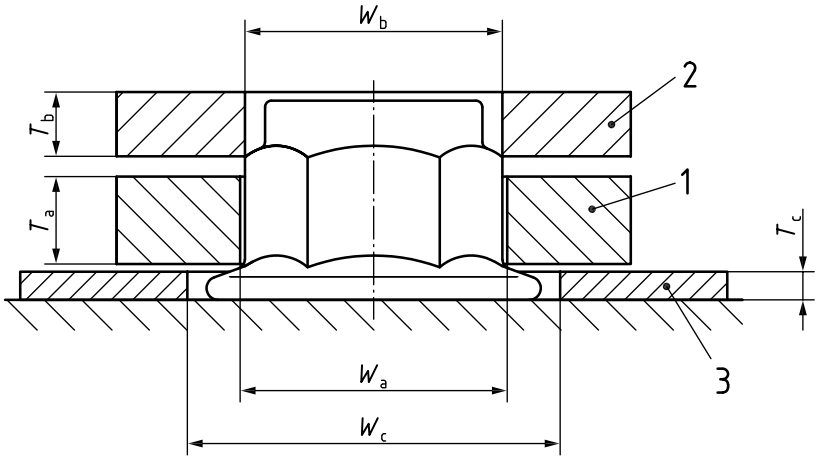
See Figure A.1 and Table A.1.

The nut shall be gauged using two plain ring gauges, A and B, to demonstrate the coincidental acceptability of hexagon height, wrenching height, corner fill and width across corners. Gauge A shall be placed over the hexagon and shall be seated on the flange. Gauge B shall be placed on the top of the nut normal to the nut axis. The two gauges shall not be in contact.

## A.2 Recommended method for gauging flange thickness

See Figure A.1 and Table A.1.

Gauge C is a flat feeler or ring gauge. It is used to prove that the flange thickness at the junction of the gauge with the hexagon portion is equal to or greater than specified values. The acceptance criterion is that gauge C fits under gauge A without contact where the nut is seated on a flat plate.




**Key**
1 gauge A
2 gauge B
3 gauge C

NOTE $W_{a,min} = e_{theoretical}$
$W_{b,max} = e_{min} - 0{,}01$ mm
$T_{a,max} = m_{w,min}$

**Figure A.1**

**Table A.1**

Dimensions in millimetres

| Nominal thread diameter | Gauge A | | | | Gauge B | | | Gauge C | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $W_a$ | | $T_a$ | | $W_b$ | | $T_b$ | $W_c$ | $T_c$ | |
| $D$ | max. | min. | max. | min. | max. | min. | min. | min. | max. | min. |
| **8** | 15,02 | 15,01 | 4,60 | 4,59 | 14,37 | 14,36 | 4 | 20 | 1,31 | 1,30 |
| **10** | 17,33 | 17,32 | 5,60 | 5,59 | 16,63 | 16,62 | 5 | 24 | 1,81 | 1,80 |
| **12** | 20,79 | 20,78 | 6,80 | 6,79 | 20,02 | 20,01 | 5 | 29 | 2,20 | 2,19 |
| **14** | 24,26 | 24,25 | 7,70 | 7,69 | 23,35 | 23,34 | 6 | 32,5 | 2,55 | 2,54 |
| **16** | 27,72 | 27,71 | 8,90 | 8,89 | 26,74 | 26,73 | 6 | 37 | 2,96 | 2,95 |
| **20** | 34,65 | 34,64 | 10,70 | 10,69 | 32,94 | 32,93 | 6 | 45 | 3,70 | 3,69 |

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