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## Fasteners — Hexagon weld nuts with flange

*Fixations — Écrous hexagonaux à souder, à embase plate*

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## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 2, *Fasteners*, Subcommittee SC 12, *Fasteners with metric internal thread*.

This second edition cancels and replaces the first edition (ISO 21670:2003), of which it constitutes a minor revision.

# Fasteners — Hexagon weld nuts with flange

## 1 Scope

This International Standard specifies characteristics for hexagon weld nuts with flange, with sizes M5 to M16 (coarse thread) or  $D = 8$  mm to 16 mm (fine pitch thread), of product grade A.

Weld nuts conforming to this International Standard are suitable for use with bolts of property classes up to 10.9 according to ISO 898-1.

## 2 Normative references

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

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

ISO 898-1, *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*

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 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 3269, *Fasteners — Acceptance inspection*

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

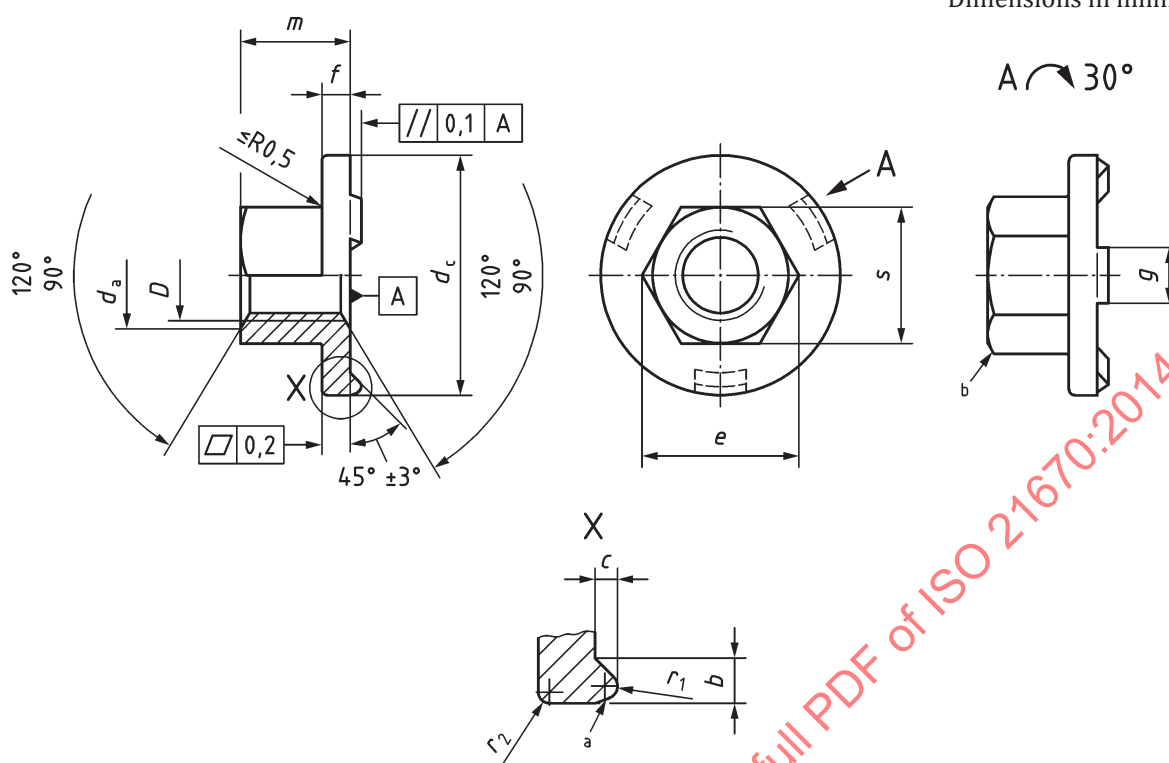
ISO 6157-2, *Fasteners — Surface discontinuities — Part 2: Nuts*

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

## 3 Dimensions

Nut dimensions shall be as given in [Figure 1](#) and [Table 1](#).

Dimensions in millimetres

**Key**

- a Pressing contour.  
b Pressing contour, at least 15°.

**Figure 1 — Nut dimensions****Table 1 — Nut dimensions**

Dimensions in millimetres

| Thread size |                   | $P_2^b$ | $b$      | $c$       | $d_a$ | $d_c$  | $e$  | $f$        | $g$       | $m$   |       | $s$ | $r_1$     | $r_2$     | Approx. mass<br>( $\rho = 7,85 \text{ kg/dm}^3$ )<br>per<br>1 000 pieces<br>kg |
|-------------|-------------------|---------|----------|-----------|-------|--------|------|------------|-----------|-------|-------|-----|-----------|-----------|--------------------------------------------------------------------------------|
| $D$         | $D \times P_1^a$  |         |          |           |       |        |      |            |           |       |       |     |           |           |                                                                                |
|             |                   |         | $0 -0,2$ | $\pm 0,1$ | max.  | $0 -1$ | min. | $\pm 0,25$ | $\pm 0,1$ | min.  | max.  | h14 | $\pm 0,1$ | $\pm 0,1$ |                                                                                |
| <b>M5</b>   | —                 | 0,8     | 2,20     | 0,8       | 6     | 15,5   | 8,2  | 1,7        | 4,0       | 4,70  | 5,00  | 8   | 0,6       | 0,3       |                                                                                |
| <b>M6</b>   | —                 | 1       | 2,70     | 0,8       | 7     | 18,5   | 10,6 | 2,0        | 5,0       | 6,64  | 7,00  | 10  | 0,6       | 0,5       | 5,7                                                                            |
| <b>M8</b>   | <b>M8 × 1</b>     | 1,25    | 2,70     | 1,0       | 9,5   | 22,5   | 13,6 | 2,5        | 6,0       | 9,64  | 10,00 | 13  | 0,8       | 0,8       | 12,2                                                                           |
| <b>M10</b>  | <b>M10 × 1,25</b> | 1,5     | 2,95     | 1,2       | 11,5  | 26,5   | 16,9 | 3,0        | 7,0       | 12,57 | 13    | 16  | 1,0       | 1,0       | 21,8                                                                           |
|             | <b>M10 × 1</b>    |         |          |           |       |        |      |            |           |       |       |     |           |           |                                                                                |
| <b>M12</b>  | <b>M12 × 1,5</b>  | 1,75    | 3,20     | 1,2       | 14    | 30,5   | 19,4 | 3,0        | 8,0       | 14,57 | 15    | 18  | 1,0       | 1,2       | 29,4                                                                           |
|             | <b>M12 × 1,25</b> |         |          |           |       |        |      |            |           |       |       |     |           |           |                                                                                |
| <b>M14</b>  | <b>M14 × 1,5</b>  | 2       | 3,45     | 1,2       | 16    | 33,5   | 22,4 | 4,0        | 8,0       | 16,16 | 17    | 21  | 1,0       | 1,2       | 45,8                                                                           |
| <b>M16</b>  | <b>M16 × 1,5</b>  | 2       | 3,70     | 1,2       | 18    | 36,5   | 25,0 | 4,0        | 8,0       | 18,66 | 19,50 | 24  | 1,0       | 1,2       | 63,1                                                                           |

<sup>a</sup>  $P_1$  is the pitch of the fine pitch thread.

<sup>b</sup>  $P_2$  is the pitch of the coarse pitch thread.

## 4 Technical delivery conditions

### 4.1 General requirements

General requirements are specified in ISO 8992.

### 4.2 Material

Weld nuts with flange shall be made of steel with a maximum carbon content of 0,25 % having a carbon equivalent content CEV of maximum 0,53 % (mass fraction) determined as follows:

$$CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

If quenching and tempering of the nuts is required, the hardness shall not exceed 300 HV.

Use of free-cutting steel is not permissible.

If a specific steel is required, this shall be agreed on ordering.

### 4.3 Tolerances

Weld nuts with flange shall be of product grade A in accordance with ISO 4759-1, with threads in accordance with ISO 724, however, with tolerance class 6G in accordance with ISO 965-3.

### 4.4 Mechanical properties

Weld nuts according to this International Standard shall meet the proof load values as specified in [Table 2](#). The proof load test shall be in accordance with ISO 898-2.

In case of dispute, welding projections shall be removed prior to testing.

**Table 2 — Proof load values**

| Coarse pitch thread<br><i>D</i> | Proof load<br><i>N</i> | Fine pitch thread<br><i>D × P<sub>1</sub></i> | Proof load<br><i>N</i> |
|---------------------------------|------------------------|-----------------------------------------------|------------------------|
| <b>M5</b>                       | 14 800                 | —                                             | —                      |
| <b>M6</b>                       | 20 900                 | —                                             | —                      |
| <b>M8</b>                       | 38 100                 | <b>M8 × 1</b>                                 | 43 100                 |
| <b>M10</b>                      | 60 300                 | <b>M10 × 1,25</b><br><b>M10 × 1</b>           | 67 300<br>71 000       |
| <b>M12</b>                      | 88 500                 | <b>M12 × 1,5</b><br><b>M12 × 1,25</b>         | 97 800<br>102 200      |
| <b>M14</b>                      | 120 800                | <b>M14 × 1,5</b>                              | 138 800                |
| <b>M16</b>                      | 164 900                | <b>M16 × 1,5</b>                              | 185 400                |

### 4.5 Surface finish

Hexagon weld nuts with flange are delivered uncoated.

Since uncoated weld nuts may be affected by corrosion during transport or storage, the manufacturer shall prove corrosion protection that does not impair nut weldability.

## 4.6 Surface integrity

Limits for surface discontinuities are specified in ISO 6157-2.

## 4.7 Acceptance inspection

Acceptance inspection shall comply with the specifications given in ISO 3269.

## 5 Designation

EXAMPLE 1 A hexagon weld nut with flange, thread M10, made of steel, not quenched and tempered, which is suitable for use with a corresponding bolt or screw of property class 10.9, is designated as follows:

**Weld nut ISO 21670 - M10 - St**

If a quenched and tempered weld nut is agreed, the symbol QT shall be added to the designation.

EXAMPLE 2 A hexagon weld nut with flange, thread M12 × 1,5, made of steel, quenched and tempered, which is suitable for use with a corresponding bolt or screw of property class 10.9, is designated as follows:

**Weld nut ISO 21670 - M12 × 1,5 - St - QT**

## 6 Marking

Hexagon weld nuts with flange of size M5 or greater shall be marked with the manufacturer's mark. The marking shall be at the nut face which is opposite to the flange.

## 7 Connecting dimensions

See [Figure 2](#) and [Table 3](#).

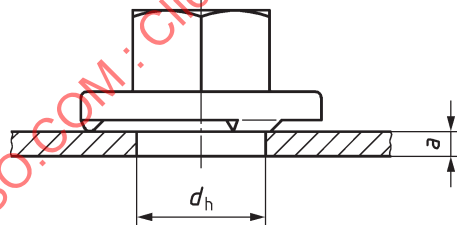


Figure 2 — Connecting dimensions (nut not welded on)