
International Standard



7413

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Hexagon nuts for structural bolting, style 1, hot-dip galvanized (oversize tapped) — Product grades A and B — Property classes 5, 6 and 8

Écrous hexagonaux galvanisés à chaud pour constructions métalliques (filetages majorés), style 1 — Grades A et B — Classes de qualité 5, 6 et 8

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[ISO 7413:1984](#)

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Descriptors : fasteners, nuts (fasteners), hexagonal nuts, specifications, dimensions, designation, marking.

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. Every 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7413 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

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Hexagon nuts for structural bolting, style 1, hot-dip galvanized (oversize tapped) — Product grades A and B — Property classes 5, 6 and 8

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0 Introduction

This International Standard is part of the complete ISO product standard series on hexagon drive fasteners. The series comprises:

- a) hexagon head bolts (ISO 4014, ISO 4015 and ISO 4016);
- b) hexagon head screws (ISO 4017 and ISO 4018);
- c) hexagon nuts (ISO 4032, ISO 4033, ISO 4034, ISO 4035 and ISO 4036);
- d) hexagon flanged bolts;¹⁾
- e) hexagon flanged screws;¹⁾
- f) hexagon flanged nuts (ISO 4161);
- g) structural bolting (ISO 4775 and ISO 7411 to ISO 7417).

1 Scope and field of application

This International Standard gives specifications for hexagon nuts, style 1, with metric dimensions in property classes 5, 6 and 8, hot-dip galvanized in accordance with ISO 1461 and tapped oversize to tolerance class 6AX. This International Stan-

dard covers thread sizes from M10 up to and including M36, product grade A for sizes up to and including M16, and product grade B for sizes over M16.

If in special cases specifications other than those listed in this International Standard are required, they should be selected from existing International Standards, for example, ISO 261, ISO 898, ISO 965 and ISO 4759/1.

NOTE — Other hot-dip galvanized nuts with 6H threads may be supplied by agreement between the manufacturer and the purchaser.

2 References

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

ISO 898, *Mechanical properties of fasteners.*

ISO 965, *ISO general purpose metric screw threads — Tolerances.*

ISO 1461, *Metallic coatings — Hot-dip galvanized coatings on fabricated ferrous products — Requirements.*

ISO 3269, *Fasteners — Acceptance inspection.*

ISO 4759/1, *Tolerances for fasteners — Part 1: Bolts, screws and nuts, with thread diameters > 1,6 and < 150 mm and product grades A, B and C.*

1) These will form the subject of a future International Standard.

3 Dimensions

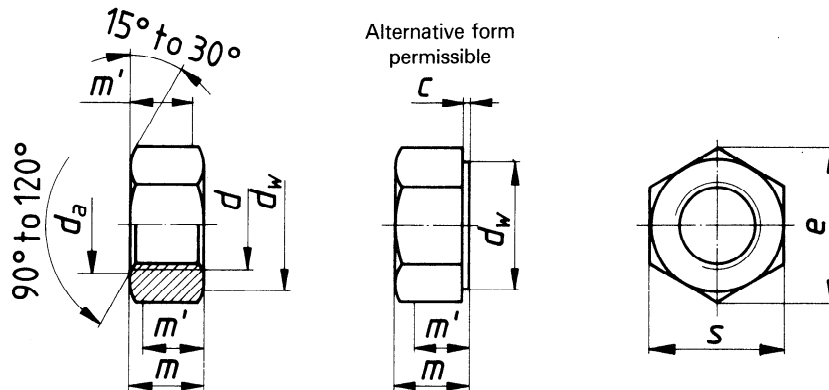


Table 1 – General dimensions

Dimensions in millimetres

| Thread size, d | | M10 | M12 | (M14) ²⁾ | M16 | M20 | M24 | M30 | M36 |
|-------------------|------|-------|-------|---------------------|-------|-------|-------|-------|-------|
| p ¹⁾ | | 1,5 | 1,75 | 2 | 2 | 2,5 | 3 | 3,5 | 4 |
| c | max. | 0,6 | 0,6 | 0,6 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 |
| d_a | min. | 10 | 12 | 14 | 16 | 20 | 24 | 30 | 36 |
| | max. | 10,8 | 13 | 15,1 | 17,3 | 21,6 | 25,9 | 32,4 | 38,9 |
| d_w | min. | 14,6 | 16,6 | 19,6 | 22,5 | 27,7 | 33,2 | 42,7 | 51,1 |
| e | min. | 17,77 | 20,03 | 23,35 | 26,75 | 32,95 | 39,55 | 50,85 | 60,79 |
| m | max. | 8,4 | 10,8 | 12,8 | 14,8 | 18 | 21,5 | 25,6 | 31 |
| | min. | 8,04 | 10,37 | 12,1 | 14,1 | 16,9 | 20,28 | 24,3 | 29,4 |
| m' | min. | 6,43 | 8,3 | 9,68 | 11,28 | 13,52 | 16,16 | 19,44 | 23,52 |
| s | max. | 16 | 18 | 21 | 24 | 30 | 36 | 46 | 55 |
| | min. | 15,73 | 17,73 | 20,67 | 23,67 | 29,16 | 35 | 45 | 53,8 |

- 1) P = pitch of the thread
- 2) The thread size in brackets should be avoided if possible.

4 Specifications and reference standards

Table 2 – Specifications and reference standards

| | | |
|---|------------------------|---|
| Material | | Steel |
| Thread | Tolerance | 6AX ¹⁾ (See annex also) |
| | International Standard | ISO 261 |
| Mechanical properties²⁾ | Class | 5-6-8 |
| | International Standard | ISO 898/2 |
| Tolerances | Product grade | A up to M16, B over M16 |
| | International Standard | ISO 4759/1 |
| Surface finish | Type | Hot-dip galvanized |
| | International Standard | ISO 1461 |
| Acceptability | | For acceptance procedure, see ISO 3269. |

1) The nuts are oversize tapped. The thread tolerances for oversize tapped hot-dip galvanized nuts to ISO 1461 have been temporarily designated 6AX and the thread limits are included in the annex on a provisional basis, pending the adoption of this thread class, when it is anticipated it will be included in ISO 965.

2) For proof load values, see clause 5.

5 Proof load values — Tolerance class 6AX

Table 3 — Proof load values for tolerance class 6AX

| Thread size <i>d</i> | Pitch of thread <i>P</i> mm | Nominal stress area of standard test mandrel <i>A_s</i> mm ² | Property class | | |
|-------------------------|-----------------------------------|---|----------------|---------|---------|
| | | | 5 | 6 | 8 |
| | | | Proof load, N | | |
| M10 | 1,5 | 58,0 | 28 000 | 32 000 | 41 200 |
| M12 | 1,75 | 84,3 | 43 000 | 48 900 | 59 800 |
| M14 | 2 | 115 | 58 700 | 66 700 | 81 700 |
| M16 | 2 | 157 | 80 000 | 91 100 | 111 500 |
| M20 | 2,5 | 245 | 137 200 | 159 200 | 208 200 |
| M24 | 3 | 353 | 197 600 | 229 500 | 300 000 |
| M30 | 3,5 | 561 | 314 200 | 364 700 | 476 900 |
| M36 | 4 | 817 | 457 500 | 531 000 | 694 500 |

NOTES

- 1 All other mechanical property requirements as ISO 898/2.
- 2 For methods of test, see ISO 898/2.
- 3 Based on the following proof load stresses:

| Thread size <i>d</i> | Property class | | |
|--|----------------|-----|-----|
| | 5 | 6 | 8 |
| Proof load stress N/mm ² | | | |
| M10 | 483 | 551 | 710 |
| M12, M14, M16 | 510 | 580 | 710 |
| M20, M24, M30, M36 | 560 | 650 | 850 |

6 Designation

Example for the designation of an oversize tapped hot-dip galvanized hexagon nut, style 1 of thread size *d* = M12 and property class 8:

Hexagon nut ISO 7413 - M12 - 8

7 Marking

7.1 Product

Nuts shall be marked in accordance with the requirements of ISO 898/2.

7.2 Packaging

The containers of all oversize tapped hot-dip galvanized hexagon nuts shall be marked:

Hot-dip galvanized nuts, style 1, oversize tapped to ISO 7413

Annex

Thread dimensions for hot-dip galvanized nuts
tolerance class 6AX

This annex gives information on screw thread limits for hot-dip galvanized nuts with a tolerance class 6AX. The limits given in table 4 apply after the hot-dip galvanized coating has been applied.

Table 4 – Screw thread limits for tolerance class 6AX

Dimensions in millimetres

| Thread size <i>d</i> | Major diameter | | Pitch diameter | | Minor diameter | |
|-------------------------|----------------|--------|----------------|--------|----------------|--------|
| | max. | min. | max. | min. | max. | min. |
| M10 | 10,638 | 10,458 | 9,556 | 9,376 | 9,026 | 8,726 |
| M12 | 12,676 | 12,476 | 11,413 | 11,213 | 10,791 | 10,455 |
| M14 | 14,706 | 14,494 | 13,263 | 13,051 | 12,560 | 12,185 |
| M16 | 16,756 | 16,544 | 15,313 | 15,101 | 14,610 | 14,235 |
| M20 | 20,804 | 20,580 | 19,000 | 18,776 | 18,144 | 17,694 |
| M24 | 24,931 | 24,666 | 22,766 | 22,501 | 21,702 | 21,202 |
| M30 | 31,083 | 30,803 | 28,557 | 28,277 | 27,321 | 26,761 |
| M36 | 37,189 | 36,889 | 34,302 | 34,002 | 32,870 | 32,270 |

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NOTES

1 Nuts are tapped oversize to the above dimensions after galvanizing.

2 Based on a tolerance of:

350 µm for M10, M12 and M14;

400 µm for M16 and M20;

450 µm for M24;

550 µm for M30;

600 µm for M36.

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