

# Hexagon thin nuts (chamfered) — Product grades A and B

The European Standard EN ISO 4035:2000 has the status of a  
British Standard

ICS 21.060.20

## National foreword

This British Standard is the official English language version of EN ISO 4035:2000. It is identical with ISO 4035:1999. It supersedes BS EN 24035:1992 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee FME/9, Bolts, nuts and accessories, to Subcommittee FME/9/6, General purpose fasteners and accessories, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

### Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, the EN ISO foreword page, the ISO title page, pages ii and iii, a blank page, pages 1 to 6, the annex ZA page and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 February 2001

© BSI 02-2001

ISBN 0 580 36189 6

### Amendments issued since publication

| Amd. No. | Date | Comments |
|----------|------|----------|
|          |      |          |
|          |      |          |
|          |      |          |
|          |      |          |
|          |      |          |

English version

**Hexagon thin nuts (chamfered) - Product grades A and B (ISO  
4035:1999)**

Ecrous bas hexagonaux (chanfreinés) - Grades A et B (ISO  
4035:1999)

Sechskantmuttern, niedrige Form (mit Fase) -  
Produktklassen A und B (ISO 4035:1999)

This European Standard was approved by CEN on 26 October 2000.

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 Management Centre 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 Management Centre 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.



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

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

## Foreword

The text of the International Standard from Technical Committee ISO/TC 2 "Fasteners" of the International Organization for Standardization (ISO) has been taken over as an European Standard by 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 2001, and conflicting national standards shall be withdrawn at the latest by May 2001.

This European Standard supersedes EN 24035:1991.

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 4035:1999 has been approved by CEN as a European Standard without any modification.

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

INTERNATIONAL  
STANDARD

**ISO**  
**4035**

Third edition  
1999-08-15

---

---

**Hexagon thin nuts (chamfered) — Product  
grades A and B**

*Écrous bas hexagonaux (chanfreinés) — Grades A et B*



## **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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 4035 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

This third edition cancels and replaces the second edition (ISO 4035:1986) which has been technically revised.

## Introduction

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

- a) hexagon head bolts (ISO 4014 to ISO 4016 and ISO 8765);
- b) hexagon head screws (ISO 4017, ISO 4018 and ISO 8676);
- c) hexagon nuts (ISO 4032 to ISO 4036, ISO 8673 to ISO 8675);
- d) hexagon bolts with flange (ISO 4162 and ISO 15071);
- e) hexagon nuts with flange (ISO 4161 and ISO 10663);
- f) structural bolts and nuts (ISO 4775, ISO 7411 to ISO 7414 and ISO 7417).





# Hexagon thin nuts (chamfered) — Product grades A and B

## 1 Scope

This International Standard specifies the characteristics of chamfered hexagon thin nuts, with threads from M1,6 up to and including M64, with product grade A for threads  $d \leq M16$  and product grade B for threads  $d > M16$ .

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 724, ISO 898-2, ISO 965-1, ISO 3506-2 and ISO 4759-1.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 225:1983, *Fasteners — Bolts, screws, studs and nuts — Symbols and designations of dimensions.*

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 965-1:1998, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data.*

ISO 3269:—<sup>1)</sup>, *Fasteners — Acceptance inspection.*

ISO 3506-2:1997, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 2: Nuts.*

ISO 4042:1999, *Fasteners — Electroplated coatings.*

ISO 4759-1:—<sup>2)</sup>, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C.*

ISO 6157-2:1988, *Fasteners — Surface discontinuities — Part 2: Nuts.*

ISO 8839:1986, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals.*

ISO 8992:1986, *Fasteners — General requirements for bolts, screws, studs and nuts.*

ISO 16083:—<sup>3)</sup>, *Fasteners — Non-electrolytically applied zinc flake coatings.*

---

<sup>1)</sup> To be published. (Revision of ISO 3269:1988)

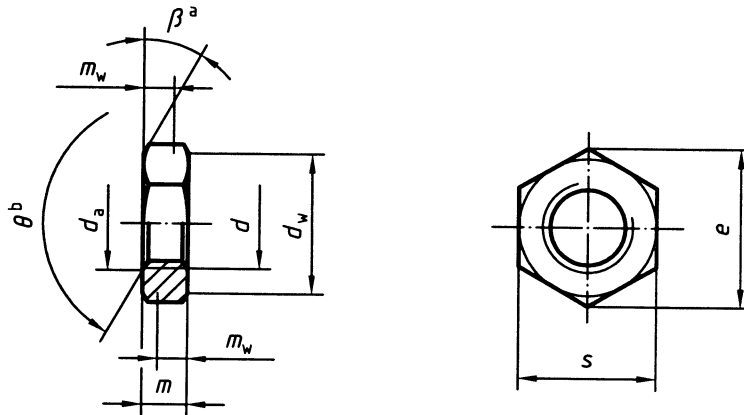
<sup>2)</sup> To be published. (Revision of ISO 4759-1:1978)

<sup>3)</sup> To be published.

### 3 Dimensions

See Figure 1 and Tables 1 and 2.

Symbols and descriptions of dimensions are defined in ISO 225.



a  $\beta = 15^\circ$  to  $30^\circ$

b  $\theta = 110^\circ$  to  $120^\circ$

Figure 1

Table 1 — Preferred threads

Dimensions in millimetres

| Thread ( <i>d</i> ) |             | M1,6 | M2   | M2,5 | M3   | M4   | M5   | M6    | M8    | M10   | M12   |
|---------------------|-------------|------|------|------|------|------|------|-------|-------|-------|-------|
| $p^a$               |             | 0,35 | 0,4  | 0,45 | 0,5  | 0,7  | 0,8  | 1     | 1,25  | 1,5   | 1,75  |
| $d_a$               | max.        | 1,84 | 2,3  | 2,9  | 3,45 | 4,6  | 5,75 | 6,75  | 8,75  | 10,8  | 13    |
|                     | min.        | 1,60 | 2,0  | 2,5  | 3,00 | 4,0  | 5,00 | 6,00  | 8,00  | 10,0  | 12    |
| $d_w$               | min.        | 2,4  | 3,1  | 4,1  | 4,6  | 5,9  | 6,9  | 8,9   | 11,6  | 14,6  | 16,6  |
| $e$                 | min.        | 3,41 | 4,32 | 5,45 | 6,01 | 7,66 | 8,79 | 11,05 | 14,38 | 17,77 | 20,03 |
| $m$                 | max.        | 1,00 | 1,20 | 1,60 | 1,80 | 2,20 | 2,70 | 3,2   | 4,0   | 5,0   | 6,0   |
|                     | min.        | 0,75 | 0,95 | 1,35 | 1,55 | 1,95 | 2,45 | 2,9   | 3,7   | 4,7   | 5,7   |
| $m_w$               | min.        | 0,6  | 0,8  | 1,1  | 1,2  | 1,6  | 2    | 2,3   | 3     | 3,8   | 4,6   |
| $s$                 | nom. = max. | 3,20 | 4,00 | 5,00 | 5,50 | 7,00 | 8,00 | 10,00 | 13,00 | 16,00 | 18,00 |
|                     | min.        | 3,02 | 3,82 | 4,82 | 5,32 | 6,78 | 7,78 | 9,78  | 12,73 | 15,73 | 17,73 |

| Thread ( <i>d</i> )               |             | M16   | M20   | M24   | M30   | M36   | M42  | M48  | M56   | M64    |
|-----------------------------------|-------------|-------|-------|-------|-------|-------|------|------|-------|--------|
| $p^a$                             |             | 2     | 2,5   | 3     | 3,5   | 4     | 4,5  | 5    | 5,5   | 6      |
| $d_a$                             | max.        | 17,3  | 21,6  | 25,9  | 32,4  | 38,9  | 45,4 | 51,8 | 60,5  | 69,1   |
|                                   | min.        | 16,0  | 20,0  | 24,0  | 30,0  | 36,0  | 42,0 | 48,0 | 56,0  | 64,0   |
| $d_w$                             | min.        | 22,5  | 27,7  | 33,2  | 42,8  | 51,1  | 60   | 69,5 | 78,7  | 88,2   |
| $e$                               | min.        | 26,75 | 32,95 | 39,55 | 50,85 | 60,79 | 71,3 | 82,6 | 93,56 | 104,86 |
| $m$                               | max.        | 8,00  | 10,0  | 12,0  | 15,0  | 18,0  | 21,0 | 24,0 | 28,0  | 32,0   |
|                                   | min.        | 7,42  | 9,1   | 10,9  | 13,9  | 16,9  | 19,7 | 22,7 | 26,7  | 30,4   |
| $m_w$                             | min.        | 5,9   | 7,3   | 8,7   | 11,1  | 13,5  | 15,8 | 18,2 | 21,4  | 24,3   |
| $s$                               | nom. = max. | 24,00 | 30,00 | 36    | 46    | 55,0  | 65,0 | 75,0 | 85,0  | 95,0   |
|                                   | min.        | 23,67 | 29,16 | 35    | 45    | 53,8  | 63,1 | 73,1 | 82,8  | 92,8   |
| a $P$ is the pitch of the thread. |             |       |       |       |       |       |      |      |       |        |

Table 2 — Non-preferred threads

Dimensions in millimetres

| Thread ( <i>d</i> )               |             | M3,5 | M14   | M18   | M22   | M27  | M33   | M39   | M45   | M52   | M60   |
|-----------------------------------|-------------|------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| $p^a$                             |             | 0,6  | 2     | 2,5   | 2,5   | 3    | 3,5   | 4     | 4,5   | 5     | 5,5   |
| $d_a$                             | max.        | 4,0  | 15,1  | 19,5  | 23,7  | 29,1 | 35,6  | 42,1  | 48,6  | 56,2  | 64,8  |
|                                   | min.        | 3,5  | 14,0  | 18,0  | 22,0  | 27,0 | 33,0  | 39,0  | 45,0  | 52,0  | 60,0  |
| $d_w$                             | min.        | 5,1  | 19,6  | 24,9  | 31,4  | 38   | 46,6  | 55,9  | 64,7  | 74,2  | 83,4  |
| $e$                               | min.        | 6,58 | 23,36 | 29,56 | 37,29 | 45,2 | 55,37 | 66,44 | 76,95 | 88,25 | 99,21 |
| $m$                               | max.        | 2,00 | 7,00  | 9,00  | 11,0  | 13,5 | 16,5  | 19,5  | 22,5  | 26,0  | 30,0  |
|                                   | min.        | 1,75 | 6,42  | 8,42  | 9,9   | 12,4 | 15,4  | 18,2  | 21,2  | 24,7  | 28,7  |
| $m_w$                             | min.        | 1,4  | 5,1   | 6,7   | 7,9   | 9,9  | 12,3  | 14,6  | 17    | 19,8  | 23    |
| $s$                               | nom. = max. | 6,00 | 21,00 | 27,00 | 34    | 41   | 50    | 60,0  | 70,0  | 80,0  | 90,0  |
|                                   | min.        | 5,82 | 20,67 | 26,16 | 33    | 40   | 49    | 58,8  | 68,1  | 78,1  | 87,8  |
| a $P$ is the pitch of the thread. |             |      |       |       |       |      |       |       |       |       |       |

## 4 Specifications and reference standards

See Table 3.

**Table 3 — Specifications and reference standards**

| Material                     |   | Steel  | Stainless steel  | Non-ferrous metal  |
|------------------------------|---|--|--|--|
| <b>General requirements</b>  | International Standard  | ISO 8992   |  |  |
|                              | Tolerance   | 6H   |  |  |
| <b>Thread</b>                | International Standards   | ISO 724, ISO 965-1   |  |  |
|                              | Property class  | $d < M3$ : as agreed<br>$M3 \leq d \leq M39$ : 04, 05<br>$d > M39$ : as agreed   | $d \leq M24$ : A2-035, A4-035<br>$M24 < d \leq M39$ : A2-025, A4-025 | Materials specified in ISO 8839                                      |
| International Standards      | $d < M3$ : as agreed<br>$M3 \leq d \leq M39$ : ISO 898-2<br>$d > M39$ : as agreed | $d \leq M39$ : ISO 3506-2<br>$d > M39$ : as agreed   |  |  |
| <b>Tolerances</b>            | Product grade   | $d \leq M16$ : A<br>$d > M16$ : B  |  |  |
|                              | International Standard  | ISO 4759-1   |  |  |
| <b>Finish and/or coating</b> | As processed  | Requirements for electroplating are covered in ISO 4042<br><br>Requirements for non-electrolytically applied zinc flake coatings are covered in ISO 10683<br><br>If different electroplating requirements are desired or if requirements are needed for other finishes, they should be agreed between customer and supplier.<br><br>Limits for surface discontinuities are covered in ISO 6157-2 | Plain  | Plain<br><br>Requirements for electroplating are covered in ISO 4042 |
|                              | Acceptability   | For acceptance procedure, see ISO 3269.  |  |  |

## 5 Designation

### EXAMPLE

A chamfered hexagon thin nut with thread M12 and property class 05 is designated as follows:

**Hexagon thin nut ISO 4035 - M12 - 05**

## Bibliography

- [1] ISO 4014:1999, *Hexagon head bolts — Product grades A and B.*
- [2] ISO 4015:1979, *Hexagon head bolts — Product grade B — Reduced shank (shank diameter approximately equal to pitch diameter).*
- [3] ISO 4016:1999, *Hexagon head bolts — Product grade C.*
- [4] ISO 4017:1999, *Hexagon head screws — Product grades A and B.*
- [5] ISO 4018:1999, *Hexagon head screws — Product grade C.*
- [6] ISO 4032:1999, *Hexagon nuts, style 1 — Product grades A and B.*
- [7] ISO 4033:1999, *Hexagon nuts, style 2 — Product grades A and B.*
- [8] ISO 4034:1999, *Hexagon nuts — Product grade C.*
- [9] ISO 4036:1999, *Hexagon thin nuts (unchamfered) — Product grade B.*
- [10] ISO 4161:1999, *Hexagon nuts with flange — Coarse thread.*
- [11] ISO 4162:—<sup>4)</sup>, *Hexagon bolts with flange — Small series — Product grade combination A/B.*
- [12] ISO 4775:1984, *Hexagon nuts for high-strength structural bolting with large width across flats — Product grade B — Property classes 8 and 10.*
- [13] ISO 7411:1984, *Hexagon bolts for high-strength structural bolting with large width across flats (thread lengths according to ISO 888) — Product grade C — Property classes 8.8 and 10.9.*
- [14] ISO 7412:1984, *Hexagon bolts for high-strength structural bolting with large width across flats (short thread length) — Product grade C — Property classes 8.8 and 10.9.*
- [15] ISO 7413:1984, *Hexagon nuts for structural bolting, style 1, hot-dip galvanized (oversize tapped) — Product grades A and B — Property classes 5, 6 and 8.*
- [16] ISO 7414:1984, *Hexagon nuts for structural bolting with large width across flats, style 1 — Product grade B — Property class 10.*
- [17] ISO 7417:1984, *Hexagon nuts for structural bolting, style 2, hot-dip galvanized (oversize tapped) — Product grade A — Property class 9.*
- [18] ISO 8673:1999, *Hexagon nuts, style 1, with metric fine pitch thread — Product grades A and B.*
- [19] ISO 8674:1999, *Hexagon nuts, style 2, with metric fine pitch thread — Product grades A and B.*
- [20] ISO 8675:1999, *Hexagon thin nuts (chamfered) with metric fine pitch thread — Product grades A and B.*
- [21] ISO 8676:1999, *Hexagon head screws with metric fine pitch thread — Product grades A and B.*

---

<sup>4)</sup> To be published. (Revision of ISO 4162:1990)

## EN ISO 4035:2000

- [22] ISO 8765:1999, *Hexagon head bolts with metric fine pitch thread — Product grades A and B.*
- [23] ISO 10663:1999, *Hexagon nuts with flange — Fine pitch thread.*
- [24] ISO 15071:1999, *Hexagon bolts with flange — Small series — Product grade A.*

**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 225            | 1983        | Fasteners - Bolts, screws, studs and nuts - Symbols and designations of dimensions                 | EN 20225      | 1991        |
| ISO 898-2          | 1992        | Mechanical properties of fasteners - Part 2: Nuts with specified proof load values - Coarse thread | EN 20898-2    | 1993        |
| ISO 3269           | 2000        | Fasteners - Acceptance inspection  | EN ISO 3269   | 2000        |
| ISO 3506-2         | 1997        | Mechanical properties of corrosion-resistant stainless-steel fasteners - Part 2: Nuts              | EN ISO 3506-2 | 1997        |
| ISO 4042           | 1999        | Fasteners - Electroplated coatings   | EN ISO 4042   | 1999        |
| ISO 8839           | 1986        | Mechanical properties of fasteners - Bolts, screws, studs and nuts made of non-ferrous metals      | EN 28839      | 1991        |

---

## BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

### Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

### Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001. Standards are also available from the BSI website at <http://www.bsi-global.com>.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

### Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001. Further information about BSI is available on the BSI website at <http://www.bsi-global.com>.

### Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

If permission is granted, the terms may include royalty payments or a licensing agreement. Details and advice can be obtained from the Copyright Manager. Tel: 020 8996 7070.