

## ISO metric hexagon nuts

[ISO title: Hexagon nuts, style 2—Product grades A and B]

This Australian Standard was prepared by Committee ME/29, Fasteners. It was approved on behalf of the Council of Standards Australia on 21 April 2000 and published on 23 June 2000.

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Australian Standard <sup>TM</sup>

**ISO metric hexagon nuts**

**Part 2: Style 2—Product grades A and B**

Originated as AS 1112—1972.  
Previous edition AS/NZS 1112:1996.  
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## PREFACE

This Standard was prepared by the Standards Australia Committee ME/29, Fasteners to supersede AS/NZS 1112:1996, *ISO metric hexagon nuts, including thin nuts, slotted nuts and castle nuts*, in part.

The objective of this Standard is to provide manufacturers, suppliers and users with the dimensions, tolerances and material requirements for style 2, hexagon nuts, ISO product grades A and B with ISO metric coarse threads.

This Standard is Part 1 of a four-part series on ISO metric hexagon nuts. The other parts give the dimensions for the following:

Part 1: Style 1—Product grades A and B.

Part 3: Product grade C.

Part 4: Chamfered thin nuts – Product grades A and B.

This edition has been technically revised and introduces the designation of product grades A and B.

NOTE: The product grade refers to the quality of the product and to the size of the tolerances where grade A is the most precise and grade C is the least precise.

Statements expressed in mandatory terms in notice to tables and figures are deemed to be requirements of this Standard.

This Standard is identical with and has been reproduced from ISO 4033:1999, *Hexagon nuts, style 2—Product grades A and B*.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text 'this International Standard' should read 'this Australian Standard'.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to equivalent Australian Standards as follows:

<i>Reference to International Standard</i>		<i>Australian Standard</i>	
ISO		AS	
225	Fasteners—Bolts, screws, studs and nuts—Symbols and designations of dimensions	—	
724	ISO general-purpose metric screw threads—Basic dimensions	—	
898	Mechanical properties of fasteners	4291	Mechanical properties of fasteners
898-2	Part 2: Nuts with specified proof load values—Coarse thread	4291.2	Part 2: Nuts with specified proof lead values—Coarse thread
965	ISO general purpose metric screw threads—Tolerances	—	
965-1	Part 1: Principles and basic data	—	
3269	Fasteners—Acceptance inspection	—	
4042	Fasteners—Electroplated coatings	—	
4759	Tolerances for fasteners	—	
4759-1	Part 1: Bolts, screws, studs and nuts—Product grades A, B and C	—	

ISO		AS
6157	Fasteners—Surface discontinuities	—
6157-2	Part 2: Nuts	—
8992	Fasteners—General requirements for bolts, screws, studs and nuts	—
10683	Fasteners—Non-electrolytically applied zinc flake coatings	—

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## 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).

NOTES



# AUSTRALIAN STANDARD

## ISO metric hexagon nuts

### Part 2: Style 2—Product grades A and B

#### 1 Scope

This International Standard specifies the characteristics of hexagon nuts, style 2, with threads from M5 up to and including M36, 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 and ISO 4759-1.

NOTE For hexagon nuts style 1, see ISO 4032.

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

ISO 10683:—<sup>3)</sup>, *Fasteners — Non-electrolytically applied zinc flake coatings*.

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

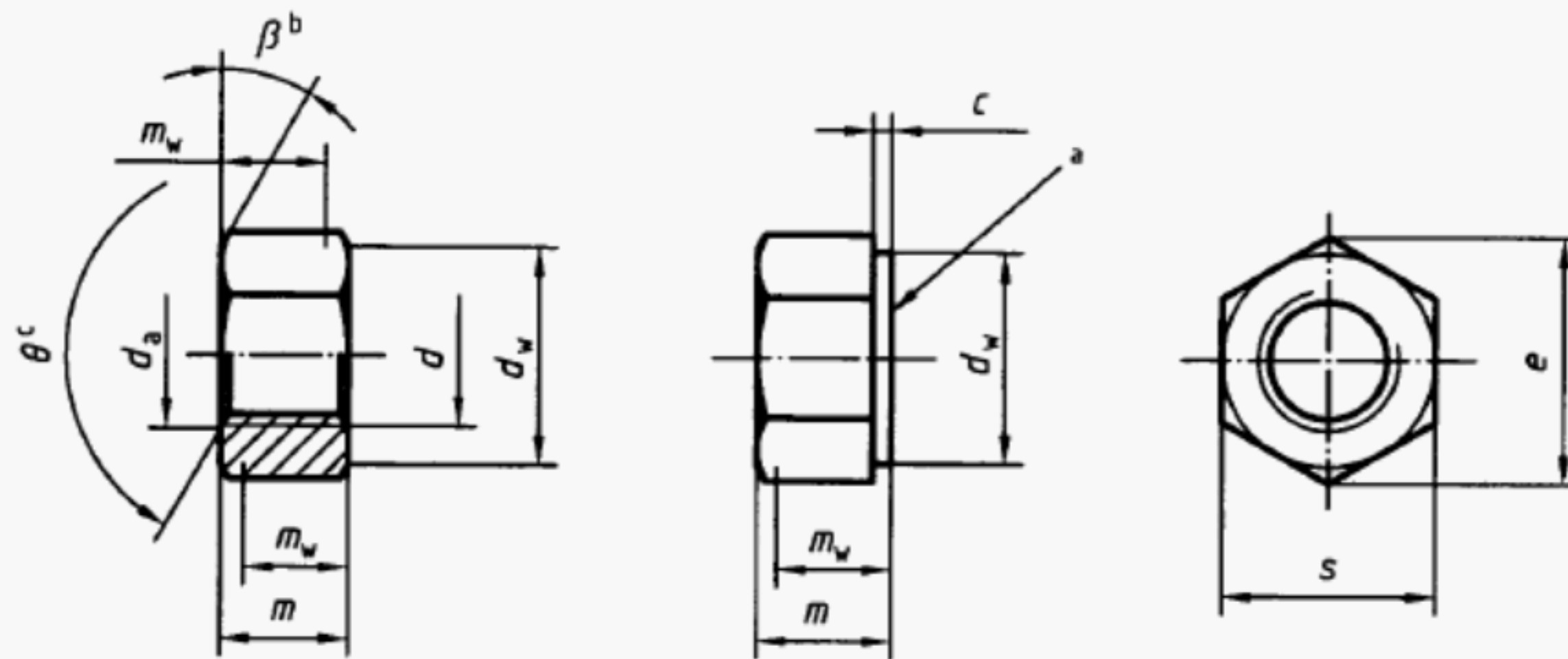
<sup>2)</sup> To be published. (Revision of ISO 4759-1:1978)

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

### 3 Dimensions

See Figure 1 and Table 1.

Symbols and descriptions of dimensions are defined in ISO 225.



- a Washer-face form to be ordered separately  
b  $\beta = 15^\circ$  to  $30^\circ$   
c  $\theta = 90^\circ$  to  $120^\circ$

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

Thread (d)		M5	M6	M8	M10	M12	(M14) <sup>a</sup>
$p^b$		0,8	1	1,25	1,5	1,75	2
c	max.	0,5	0,5	0,6	0,6	0,6	0,6
$d_a$	max.	5,75	6,75	8,75	10,8	13	15,1
	min.	5,00	6,00	8,00	10,0	12	14,0
$d_w$	min.	6,9	8,9	11,6	14,6	16,6	19,6
e	min.	8,79	11,05	14,38	17,77	20,03	23,36
m	max.	5,1	5,7	7,5	9,3	12,00	14,1
	min.	4,8	5,4	7,14	8,94	11,57	13,4
$m_w$	min.	3,84	4,32	5,71	7,15	9,26	10,7
s	max.	8,00	10,00	13,00	16,00	18,00	21,00
	min.	7,78	9,78	12,73	15,73	17,73	20,67

Thread (d)		M16	M20	M24	M30	M36
$p^b$		2	2,5	3	3,5	4
c	max.	0,8	0,8	0,8	0,8	0,8
$d_a$	max.	17,3	21,6	25,9	32,4	38,9
	min.	16,0	20,0	24,0	30,0	36,0
$d_w$	min.	22,5	27,7	33,2	42,7	51,1
e	min.	26,75	32,95	39,55	50,85	60,79
m	max.	16,4	20,3	23,9	28,6	34,7
	min.	15,7	19,0	22,6	27,3	33,1
$m_w$	min.	12,6	15,2	18,1	21,8	26,5
s	max.	24,00	30,00	36	46	55,0
	min.	23,67	29,16	35	45	53,8

<sup>a</sup> If possible, the size in parentheses should be avoided.

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

## 4 Specifications and reference standards

See Table 2.

**Table 2 — Specifications and reference standards**

<b>Material</b>		Steel
<b>General requirements</b>	International Standard	ISO 8992
<b>Thread</b>	Tolerance	6H
	International Standards	ISO 724, ISO 965-1
<b>Mechanical properties</b>	Property class <sup>a</sup>	9 and 12
	International Standard	ISO 898-2
<b>Tolerances</b>	Product grade	$d \leq M16$ : A $d > M16$ : B
	International Standard	ISO 4759-1
<b>Finish and/or coating</b>		As processed  Requirements for electroplating are covered in ISO 4042.  Requirements for non-electrolytically applied zinc flake coatings are covered in ISO 10683.  If different electroplating requirements are desired or if requirements are needed for other finishes, they should be agreed between customer and supplier.  Limits for surface discontinuities are covered in ISO 6157-2.
<b>Acceptability</b>		For acceptance procedure see ISO 3269.
<sup>a</sup> For other property classes see ISO 898-2.		

## 5 Designation

### EXAMPLE

A hexagon nut, style 2, with thread M12 and property class 9 is designated as follows:

**Hexagon nut ISO 4033 - M12 - 9**



## 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 4034:1999, *Hexagon nuts — Product grade C.*
- [8] ISO 4035:1999, *Hexagon thin nuts (chamfered) — Product grades A and B.*
- [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.*

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

- [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.*

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