

INTERNATIONAL  
STANDARD

ISO  
7044

Second edition  
1997-11-15

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**Prevailing torque type all-metal hexagon  
nuts with flange — Product grades A and B**

*Écrous hexagonaux à embase, autofreînés, tout métal — Grades A et B*

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Reference number  
ISO 7044:1997(E)

## 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.

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 7044 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 1, *Mechanical properties of fasteners*.

This second edition cancels and replaces the first edition (ISO 7044:1983), which has been technically revised.

Annex A forms an integral part of this International Standard. Annex B is for information only.

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# Prevailing torque type all-metal hexagon nuts with flange — Product grades A and B

## 1 Scope

This International Standard specifies the characteristics of prevailing torque type all-metal hexagon nuts with flange and threads from M5 to M20 inclusive, in product grade A for threads up to and including M16 and product grade B for threads above M16, and with property classes 8, 9, 10 and 12.

NOTE — The dimensions of the nuts correspond to those given in ISO 4161 plus prevailing torque feature.

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

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 261:–<sup>1)</sup>, *ISO general-purpose metric screw threads – General plan.*

ISO 965-2:–<sup>2)</sup>, *ISO general-purpose metric screw threads – Tolerances – Part 2: Limits of sizes for general purpose bolt and nut threads – Medium quality.*

ISO 2320:1997, *Prevailing torque type steel hexagon nuts – Mechanical and performance properties.*

ISO 3269:1988, *Fasteners – Acceptance inspection.*

ISO 4042:–<sup>3)</sup>, *Fasteners – Electroplated coatings.*

ISO 4759-1:–<sup>4)</sup>, *Tolerances for fasteners – Part 1: Bolts, screws, studs and nuts – Product grades A, B and C.*

ISO 6157-2:1995, *Fasteners – Surface discontinuities – Part 2: Nuts.*

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

1) To be published. (Revision of ISO 261:1973)

2) To be published. (Revision of ISO 965-2:1980)

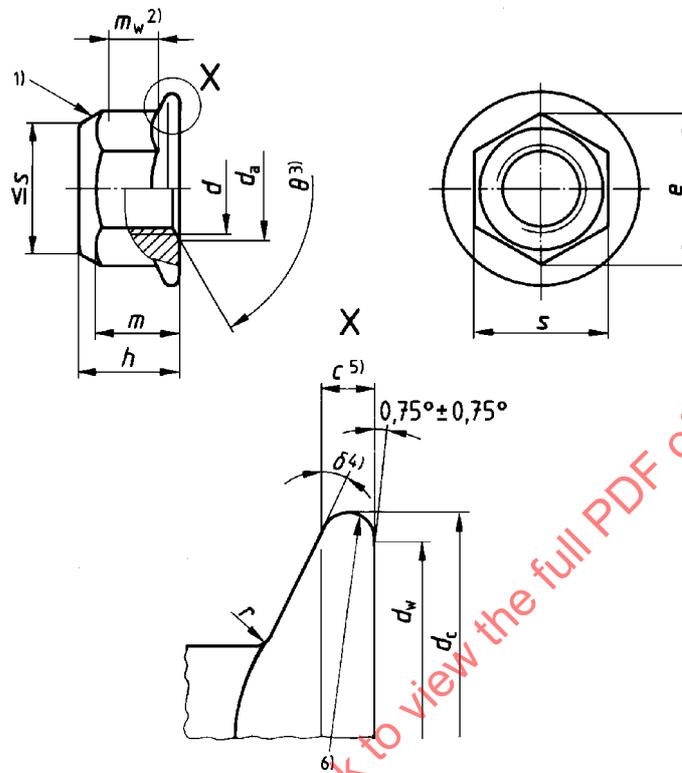
3) To be published. (Revision of ISO 4042:1989)

4) To be published. (Revision of ISO 4759-1:1978)

### 3 Dimensions

See figure 1 and table 1.

Symbols and designations of dimensions are specified in ISO 225.



- 1) Prevailing torque element, shape optional.
- 2)  $m_w$  is the wrenching height; see note to table 1.
- 3)  $\theta = 90^\circ$  to  $120^\circ$
- 4)  $\delta = 15^\circ$  to  $25^\circ$
- 5)  $c$  is measured at  $d_{w,min}$
- 6) Edge contour optional.

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

Thread ( <i>d</i> )		M5	M6	M8	M10	M12	(M14) <sup>1)</sup>	M16	M20
<i>P</i> <sup>2)</sup>		0,8	1	1,25	1,5	1,75	2	2	2,5
<i>c</i>	min.	1	1,1	1,2	1,5	1,8	2,1	2,4	3
<i>d<sub>a</sub></i>	max.	5,75	6,75	8,75	10,8	13	15,1	17,3	21,6
	min.	5,00	6,00	8,00	10,0	12	14,0	16,0	20,0
<i>d<sub>c</sub></i>	max.	11,8	14,2	17,9	21,8	26	29,9	34,5	42,8
<i>d<sub>w</sub></i>	min.	9,8	12,2	15,8	19,6	23,8	27,6	31,9	39,9
<i>e</i>	min.	8,79	11,05	14,38	16,64	20,03	23,36	26,75	32,95
<i>h</i>	max.	6,2	7,3	9,40	11,40	13,80	15,9	18,3	22,4
	min.	5,7	6,8	8,74	10,34	12,57	14,8	17,2	20,3
<i>m</i>	min.	4,7	5,7	7,64	9,64	11,57	13,3	15,3	18,7
<i>m<sub>w</sub></i>	min.	2,5	3,1	4,6	5,6	6,8	7,7	8,9	10,7
<i>s</i>	max.	8,00	10,00	13,00	15,00	18,00	21,00	24,00	30,00
	min.	7,78	9,78	12,73	14,73	17,73	20,67	23,67	29,16
<i>r</i> <sup>3)</sup>	max.	0,3	0,36	0,48	0,6	0,72	0,88	0,96	1,2

NOTE — If the product passes the gauging given in annex A, the requirements for dimensions *e*, *c* and *m<sub>w</sub>* are satisfied.

- 1) The size in parentheses should be avoided if possible.
- 2) *P* is the pitch of the thread.
- 3) Radius *r* applies both at the corner and the flats of the hexagon.

#### 4 Requirements and reference International Standards

See table 2.

Table 2 — Requirements and reference International Standards

Material		Steel				
General requirements	International Standard	ISO 8992				
Thread	Tolerance	6H				
	International Standards	ISO 261, ISO 965-2				
Mechanical and performance properties	Property class	8		9	10	12
	Style decisive for mechanical properties <sup>1)</sup>	$d \leq M16$ style 1	$d > M16$ style 2	style 2	style 1	style 2
	International Standard	ISO 2320				
Tolerances	Product grade	For $d \leq 16$ mm: A For $d > 16$ mm: B				
	International Standard	ISO 4759-1				
Finish	As processed  Requirements for electroplated coatings are covered in ISO 4042.  If different electroplating requirements are desired or if requirements are needed for other finishes, they should be negotiated between customer and supplier.  Limits for surface discontinuities are covered in ISO 6157-2.					
Acceptability	For acceptance procedure, see ISO 3269.					
<p>1) Based on the nut height (dimension <math>h_{min}</math>) nuts in accordance with this International Standard are of style 2. However, since for style 2 ISO 2320 does not specify mechanical properties for all property classes and sizes as specified in this International Standard, in some cases nuts have to be tested according to style 1.</p>						

#### 5 Designation

EXAMPLE

A prevailing torque type all-metal hexagon nut with flange, thread M12 and property class 8 is designated as follows:

Prevailing torque type hexagon nut with flange ISO 7044 – M12 – 8

## Annex A (normative)

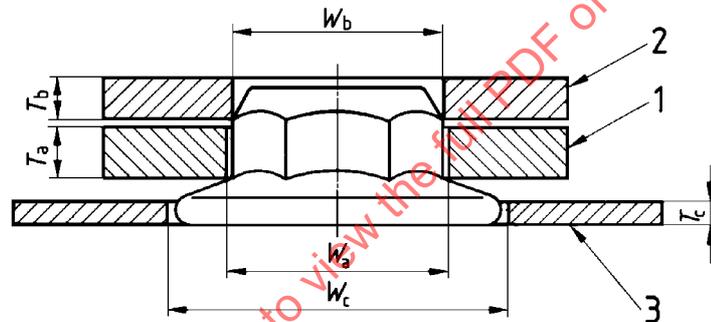
### Gauging of hexagon nuts with flange

#### 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 of flange (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 will fit under gauge A without contact when the nut is seated on a flat plate.



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

#### Key

- 1 Gauge A
- 2 Gauge B
- 3 Gauge C

Figure A.1

Table A.1

Dimensions in millimetres

Thread	Gauge A				Gauge B			Gauge C		
	$W_a$		$T_a$		$W_b$		$T_b$	$W_c$	$T_c$	
	max.	min.	max.	min.	max.	min.	min.	min.	max.	min.
M5	9,25	9,24	2,50	2,49	8,78	8,77	3	14	1,08	1,07
M6	11,56	11,55	3,10	3,09	11,04	11,03	4	16	1,19	1,18
M8	15,02	15,01	4,60	4,59	14,37	14,36	4	20	1,31	1,30
M10	17,33	17,32	5,60	5,59	16,63	16,62	5	24	1,81	1,80
M12	20,79	20,78	6,80	6,79	20,02	20,01	5	29	2,20	2,19
M14	24,26	24,25	7,70	7,69	23,35	23,34	6	32,5	2,55	2,54
M16	27,72	27,71	8,90	8,89	26,74	26,73	6	37	2,96	2,95
M20	34,65	34,64	10,70	10,69	32,94	32,93	6	45	3,70	3,69

**Annex B**  
(informative)

**Bibliography**

[1] ISO 4161:–<sup>5)</sup>, *Hexagon nuts with flange – Course thread*.

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5) To be published. (Revision of ISO 4161:1983)