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Prevailing torque (all-metal) hexagon high nuts with flange — Product grades A and B

Écrous hexagonaux hauts à embase, autofreinés (tout métal) — Grades A et B

ICS: 21.060.20

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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 (see www.iso.org/directives).

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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 fourth edition cancels and replaces the third edition (ISO 7044:2012).

This standard differs from ISO 7044:2012 as follows:

— the title has been changed in order to address the nut size (high) instead of style 2;

— the Scope has been updated;

— the threads M7 and M18 have been added;

— r_{max} has been corrected for M18 (1,1 instead of 0,9);

— the property class 9 has been deleted;

— the mechanical properties and specified property classes have been updated in accordance with the diameter ranges;

— for steel nuts, quenching and tempering have been specified in accordance with ISO 898-2 as mandatory or optional;

— the reference to ISO/TR 16224 for nut design has been added;

— "prevailing torque all-metal" has been replaced by the symbol "PTAM" in the designation.

Prevailing torque (all-metal) hexagon high nuts with flange — Product grades A and B

1 Scope

This International Standard specifies the characteristics of prevailing torque all-metal hexagon high nuts with flange, with coarse pitch thread from nominal diameter M5 through M20, with product grade A for nominal diameter ≤ M16 and product grade B for nominal diameter > M16.

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

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 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

ISO 2621, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*

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

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 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 2320, *Fasteners — Prevailing torque steel nuts — Functional properties*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 4042, *Fasteners — Electroplated coatings*

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*

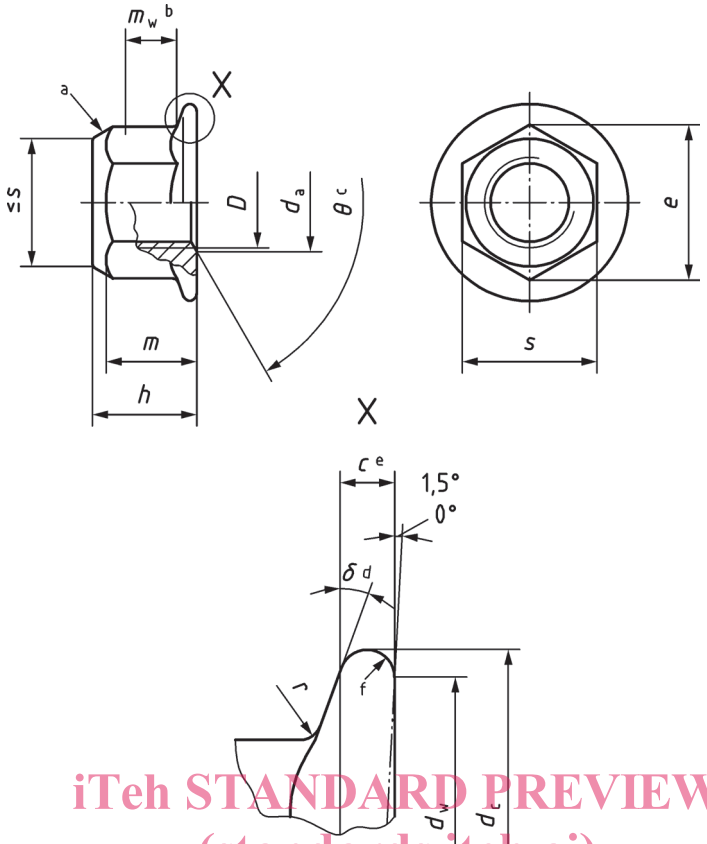
ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

3 Dimensions

See Figure 1 and Tables 1 and 2.

Symbols and descriptions of dimensions are specified in ISO 225.



Key

a Prevailing torque element, shape at the discretion of the manufacturer.

b m_w is the wrenching height, see Note to Table 1.

c θ = 90° to 120°.

d δ = 15° to 25°.

e c is measured at $d_{w,min}$.

f Contour of the edge is at the discretion of the manufacturer.

Figure 1 — Dimensions

Table 1 — Preferred threads

Dimensions in millimetres

Thread, D		M5	M6		M8	M10	M12		M16		M20
P[a]		0,8	1		1,25	1,5	1,75		2		2,5
c	min.	1,0	1,1		1,2	1,5	1,8		2,4		3,0
d_a	max.	5,75	6,75		8,75	10,80	13,00		17,30		21,60
	min.	5,00	6,00		8,00	10,00	12,00		16,00		20,00
d_c	max.	11,8	14,2		17,9	21,8	26,0		34,5		42,8
d_w	min.	9,8	12,2		15,8	19,6	23,8		31,9		39,9
e	min.	8,79	11,05		14,38	16,64	20,03		26,75		32,95
h	max.	6,20	7,30		9,40	11,40	13,80		18,30		22,40
	min.	5,70	6,80		8,74	10,34	12,57		17,20		20,30
m[b]	min.	4,70	5,70		7,64	9,64	11,57		15,30		18,70
m_w	min.	2,5	3,1		4,6	5,6	6,8		8,9		10,7
s	nom. = max.	8,00	10,00		13,00	15,00	18,00		24,00		30,00
	min.	7,78	9,78		12,73	14,73	17,73		23,67		29,16
r[c]	max.	0,3	0,4		0,5	0,6	0,7		1,0		1,2

NOTE If the nut passes the gauging given in Annex A, the requirements for dimensions *e, c* and m_w are satisfied.

[a] *P* is the pitch of the thread.

[b] *m* is the minimum thread height.

[c] Radius, *r*, applies both at the corners and the flats of the hexagon.

Table 2 — Non-preferred threads

Dimensions in millimetres

Thread, D		M7	M14	M18
P[a]		1	2	2,5
c	min.	1,1	2,1	2,7
d_a	max.	7,75	15,10	19,50
	min.	7,00	14,00	18,00
d_c	max.	16,1	29,9	38,7
d_w	min.	14,0	27,6	35,9
e	min.	12,01	23,36	29,56
h	max.	8,40	15,90	20,30
	min.	7,74	14,80	18,20
m[b]	min.	6,64	13,30	17,30
m_w	min.	3,7	7,7	10,0
s	nom. = max.	11,00	21,00	27,00
	min.	10,63	20,67	26,16
r[c]	max.	0,5	0,9	1,1

NOTE If the nut passes the gauging given in Annex A, the requirements for dimensions *e, c* and m_w are satisfied.

[a] *P* is the pitch of the thread.

[b] *m* is the minimum thread height.

[c] Radius, *r*, applies both at the corners and the flats of the hexagon.

4 Requirements and reference International Standards

See Table 3.

Table 3 — Requirements and reference International Standards

Material		Steel	
General requirements	International Standard	ISO 8992	
Thread	Tolerance class	6H[a]	
	International Standards	ISO 262, ISO 724, ISO 965-2	
Mechanical properties	Property class	M5 ≤ *D* ≤ M20	8[b], 10[c], 12[c]
		M20 < *D* ≤ M39	Property class as agreed[e]
		D < M5 and *D* > M39	Mechanical properties as agreed[d]
	International Standard	ISO 898-2	
Functional properties	International Standard	ISO 2320	
Tolerance	Product grade	*D* ≤ M16: A *D* > M16: B	
	International Standard	ISO 4759-1	
Finish — Coating		As processed Requirements for electroplating are specified in ISO 4042. Requirements for non-electrolytically applied zinc flake coatings are specified in ISO 10683. Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser.	
Surface integrity		Limits for surface discontinuities are specified in ISO 6157-2.	
Acceptability		Acceptance inspection is specified in ISO 3269.	

[a] Other tolerance classes may be specified prior to coating, depending on the type of coating to be applied. For coated nuts, see relevant coating standards, e.g. ISO 4042 and ISO 10683.

[b] May be quenched and tempered at the manufacturer's discretion, in accordance with ISO 898-2.

[c] Shall be quenched and tempered in accordance with ISO 898-2.

[d] See ISO/TR 16224 for information.

[e] The property class shall be in accordance with ISO 898-2.

5 Designation

EXAMPLE A Prevailing Torque (PT) All-Metal (AM) hexagon high nut with flange, with nominal diameter M12 and property class 8 is designated as follows:

PTAM hexagon high nut with flange ISO 7044-8:—, M12

Annex A
(informative)

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 nut 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 thickness

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 fits under gauge A without contact where the nut is seated on a flat plate.