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ISO/DIS 10513

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Prevailing torque (all-metal) hexagon high nuts, with fine pitch thread — Product grades A and B

Écrous hexagonaux hauts autofreinés tout métal à filetage métrique à pas fin — Classes de qualité 8, 10 et 12

ICS: 21.060.20

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel three month enquiry.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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Foreword

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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 third edition cancels and replaces the second edition (ISO 10513:2012).

This standard differs from ISO 10513:2012 as follows:

— the Scope has been updated;

— the preferred and the non-preferred threads are given in two separate tables, and the threads M18×1,5, M22×1,5, M27×2, M33×2 and M39×3 have been added;

— threads M10x1,25 and M20x2 have been moved to the preferred threads table;

— $h_{,max}$ have been amended for M12 (12,60 instead of 12,30) and M24 (24,00 instead of 23,90);

— for steel nuts, the property class 12 has been extended to the whole diameter range;

— 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;

— stainless steel nuts have been added;

— "prevailing torque all-metal" has been replaced by the symbol "PTAM" in the designation.

Prevailing torque (all-metal) hexagon high nuts, with fine pitch thread — Product grades A and B

1 Scope

This International Standard specifies the characteristics of prevailing torque all-metal hexagon high nuts, with fine pitch thread, with nominal diameters from 8 mm through 39 mm, with product grade A for nominal diameters $D \leq 16$ mm and product grade B for nominal diameters $D > 16$ mm.

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 262, *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, *Prevailing torque steel nuts — Functional properties*

ISO 3269, *Fasteners — Acceptance inspection*

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

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*

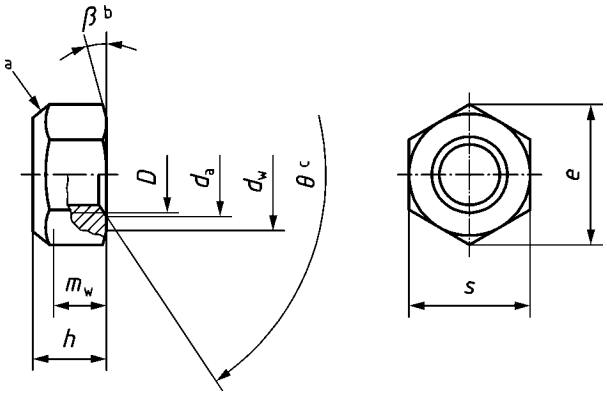
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

ISO 16048, *Passivation of corrosion-resistant stainless-steel fasteners*

3 Dimensions

See Figure 1 and Tables 1 and 2.

Symbols and descriptions of dimensions are specified in ISO 225.



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

b $\beta = 15°$ to $30°$.

c $\theta = 90°$ to $120°$.

Figure 1 — Dimensions

Table 1 — Preferred threads

Dimensions in millimetres

Thread ($D \times P$[a])		M8×1	M10×1,25	M12×1,5	M16×1,5	M20×2	M24×2	M30×2	M36×3
d_a	max.	8,75	10,80	13,00	17,30	21,60	25,90	32,40	38,90
	min.	8,00	10,00	12,00	16,00	20,00	24,00	30,00	36,00
d_w	min.	11,63	14,63	16,63	22,49	27,70	33,25	42,75	51,11
e	min.	14,38	17,77	20,03	26,75	32,95	39,55	50,85	60,79
h	max.	8,00	10,00	12,60	16,40	20,30	24,00	30,00	36,00
	min	7,14	8,94	11,57	15,70	19,00	22,60	27,30	33,10
m_w	min.	5,15	6,43	8,30	11,28	13,52	16,16	19,44	23,52
s	nom. = max.	13,00	16,00	18,00	24,00	30,00	36,00	46,00	55,00
	min.	12,73	15,73	17,73	23,67	29,16	35,00	45,00	53,80

a P is the pitch of the thread.

Table 2 — Non preferred threads

Dimensions in millimetres

Thread ($D \times P^a$)		M10×1	M12×1,25	M14×1,5	M18×2	M18×1,5	M20×1,5	M22×2	M22×1,5	M27×2	M33×2	M39×3
d_a	max.	10,80	13,00	15,10	19,50	19,50	21,60	23,70	23,70	29,10	35,60	42,10
	min.	10,00	12,00	14,00	18,00	18,00	20,00	22,00	22,00	27,00	33,00	39,00
d_w	min.	14,63	16,63	19,64	24,85	24,85	27,70	31,35	31,35	38,00	46,55	55,86
e	min.	17,77	20,03	23,36	29,56	29,56	32,95	37,29	37,29	45,20	55,37	66,44
h	max.	10,00	13,30	14,10	18,30	18,30	20,30	22,00	22,00	27,00	33,00	39,00
	min	8,94	11,57	13,40	16.90	16.90	19,00	20,50	20,50	25,40	30,90	35,90
m_w	min.	6,43	8,30	9,68	12,08	12,08	13,52	14,48	14,48	18,00	21,92	25,44
s	nom. = max.	16,00	18,00	21,00	27,00	27,00	30,00	34,00	34,00	41,00	50,00	60,00
	min.	15,73	17,73	20,67	26,16	26,16	29,16	33,00	33,00	40,00	49,00	58,80
a P is the pitch of the thread.												

4 Requirements and reference International Standards

See Table 3.

Table 3 — Requirements and reference International Standards

Material		Steel	Stainless 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	8 mm ≤ D ≤ 16 mm: 8[b], 10[c], 12[c]	8 mm ≤ D ≤ 16 mm: A2-70, A4-70, A4-80
		16 mm < D ≤ 39 mm: 8[c], 10[c], 12[c]	16 mm < D ≤ 39 mm: A2-50, A2-70, A4-70, A4-80
		D < 8 mm and D > 39 mm: Mechanical properties as agreed[d]	D < 8 mm and D > 39 mm: Mechanical properties as agreed
	International Standard	ISO 898-2	ISO 3506-2
Functional properties	International Standard	ISO 2320	As agreed
Tolerance	Product grade	D ≤ 16 mm: A D > 16 mm: 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.	Clean and bright A method for passivation is specified in ISO 16048.
		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.

5 Designation

EXAMPLE A Prevailing Torque (PT) All-Metal (AM) hexagon high nut, with nominal diameter 12 mm, with fine pitch 1,5 mm and property class 8 is designated as follows:

PTAM hexagon high nut ISO 10513 – M12 × 1,5 – 8

Bibliography

ISO/TR 16224, *Technical aspects of nut design*

