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Hexagon head screws with metric fine pitch thread — Product grades A and B

Vis à tête hexagonale à filetage métrique à pas fin entièrement filetées — Grades A et B

ICS: 21.060.10

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 11, *Fasteners with metric external thread* and by Technical Committee CEN/TC 185, *Fasteners* in collaboration.

This fourth edition cancels and replaces the third edition (ISO 8676:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

— tables for dimensions have been entirely restructured, so that the user can find his way around on a reliable manner (no risk of picking the wrong dimension);

— standard smallest lengths have been corrected as for the other hexagon head screw standards: erroneous values for M22×2, M30×2 and M36 of l_{nom} = 40 mm have been changed to 50 mm, 60 mm and 70 mm respectively; l_{nom} = 30 mm has been added for M16×1,5 as well as 80 mm for M42×3 and 110 mm for M56×4;

— greatest lengths l_{nom} have been limited to 200 mm, longer lengths are to be agreed between the purchaser and the manufacturer;

— standard greatest lengths (accidentally removed in the third edition for non-preferred diameters M18 and above) have been restored (greatest lengths l_{nom} = 10d or 200 mm whichever is the shorter as for the other hexagon head screw standards);

— property class 12.9/12.9 has been added for steel and property class 80 has been added for stainless steel;

— specifications for marking and labelling have been added as Clause 6.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Hexagon head screws with metric fine pitch thread — Product grades A and B

1 Scope

This document specifies the characteristics of hexagon head screws, in steel and stainless steel, with metric fine pitch threads M8×1 to M64×4, and with product grades A and B.

NOTE If in certain cases other specifications are requested, property classes and stainless steel grades can be selected from ISO 898-1 or ISO 3506-1, and dimensional options from ISO 888 or ISO 4753.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

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

ISO 1891-4, *Fasteners — Vocabulary — Part 4: Control, inspection, delivery, acceptance and quality*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs with specified property classes*

ISO 4042, *Fasteners — Electroplated coating systems*

ISO 4753, *Fasteners — Ends of parts with external ISO metric thread*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 6157-3, *Fasteners — Surface discontinuities — Part 3: Bolts, screws and studs for special requirements*

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

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

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

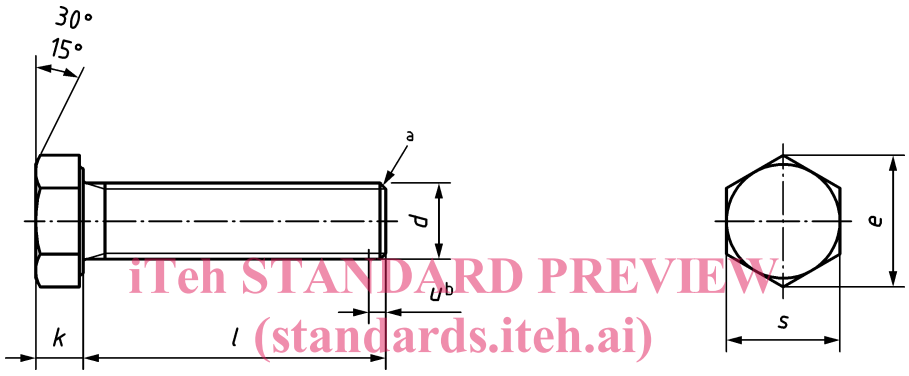
— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Dimensions

Dimensions shall be in accordance with Figures 1 and 2 and with Tables 1 to 5.

Symbols and descriptions of dimensions are defined in ISO 225.



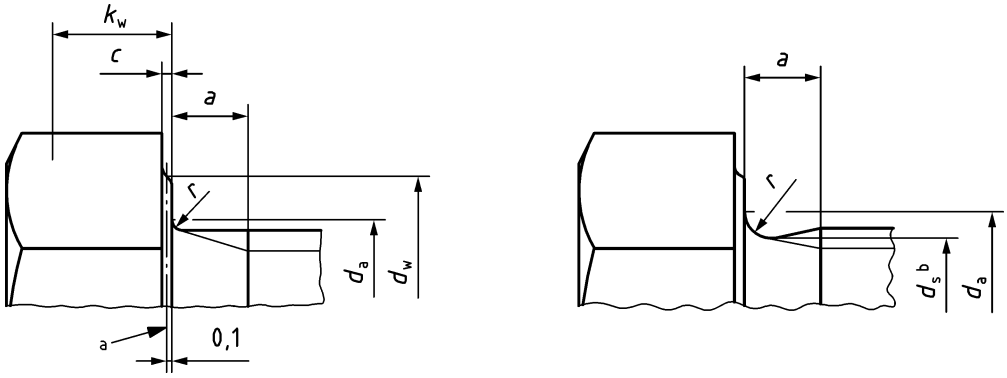
Key

a Chamfered end (CH) in accordance with ISO 4753.

b incomplete thread $u \leq 2P$, where P is the fine pitch thread specified in Tables 1 to 5.

Figure 1 — Hexagon head screw

Dimensions in millimetres



Key

a reference datum for d_w.

b $d_s \approx$ pitch diameter.

Figure 2 —Head details and permissible shapes

Table 1 — Product grade A – M8×1 to M16×1,5

Dimensions in millimetres

Thread, $d \times P$ [a]		**M8×1**	**M10×1,25**	(M10×1)	**M12×1,5**	(M12×1,25)	(M14×1,5)	**M16×1,5**
a [b]	max.	3,00	3,75	3,00	4,50	3,75	4,50	4,50
	min.	1,00	1,25	1,00	1,50	1,25	1,50	1,50
c	max.	0,60	0,60	0,60	0,60	0,60	0,60	0,80
	min.	0,15	0,15	0,15	0,15	0,15	0,15	0,20
d_a	max.	9,2	11,2	11,2	13,7	13,7	15,7	17,7
d_w	min.	11,63	14,63	14,63	16,63	16,63	19,64	22,49
e	min.	14,38	17,77	17,77	20,03	20,03	23,36	26,75
k	nom.	5,3	6,4	6,4	7,5	7,5	8,8	10
	max.	5,45	6,58	6,58	7,68	7,68	8,98	10,18
	min.	5,15	6,22	6,22	7,32	7,32	8,62	9,82
k_w	min.	3,61	4,35	4,35	5,12	5,12	6,03	6,87
r	min.	0,4	0,4	0,4	0,6	0,6	0,6	0,6
s	nom. = max.	13,00	16,00	16,00	18,00	18,00	21,00	24,00
	min.	12,73	15,73	15,73	17,73	17,73	20,67	23,67

l			**Range of standardized lengths between the stepped discontinuous lines**
nom.	min.	max.	
16	15,65	16,35	**Screws with too short lengths**
20	19,58	20,42	
25	24,58	25,42	
30	29,58	30,42	
35	34,5	35,5	
40	39,5	40,5	
45	44,5	45,5	
50	49,5	50,5	
55	54,4	55,6	
60	59,4	60,6	
65	64,4	65,6	
70	69,4	70,6	
80	79,4	80,6	
90	89,3	90,7	
100	99,3	100,7	
110	109,3	110,7	
120	119,3	120,7	
130	129,2	130,8	**Lengths to be agreed between the purchaser and the manufacturer**
140	139,2	140,8	
150	149,2	150,8	

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] Normal series in accordance with ISO 3508 ($a_{max} = 3P$) but not rounded.

Table 2 — Product grade A – M18×2 to M24×2

Dimensions in millimetres

Thread, $d \times P$ [a]			(M18×2)	(M18×1,5)	**M20×2**	(M20×1,5)	(M22×2)	(M22×1,5)	**M24×2**
a [b]		max.	6,0	4,5	6,0	4,5	6,0	4,5	6,0
		min.	2,0	1,5	2,0	1,5	2,0	1,5	2,0
c		max.	0,8	0,8	0,8	0,8	0,8	0,8	0,8
		min.	0,2	0,2	0,2	0,2	0,2	0,2	0,2
d_a		max.	20,2	20,2	22,4	22,4	24,4	24,4	26,4
d_w		min.	25,34	25,34	28,19	28,19	31,71	31,71	33,61
e		min.	30,14	30,14	33,53	33,53	37,72	37,72	39,98
k		nom.	11,5	11,5	12,5	12,5	14	14	15
		max.	11,715	11,715	12,715	12,715	14,215	14,215	15,215
		min.	11,285	11,285	12,285	12,285	13,785	13,785	14,785
k_w		min.	7,90	7,90	8,60	8,60	9,65	9,65	10,35
r		min.	0,6	0,6	0,8	0,8	0,8	0,8	0,8
s	nom. =	max.	27,00	27,00	30,00	30,00	34,00	34,00	36,00
		min.	26,67	26,67	29,67	29,67	33,38	33,38	35,38

l			**Range of standardised lengths between the stepped discontinuous lines**						
nom.	min.	max.						**Screws with too short lengths**	
35	34,5	35,5							
40	39,5	40,5							
45	44,5	45,5							
50	49,5	50,5							
55	54,4	55,6							
60	59,4	60,6							
65	64,4	65,6							
70	69,4	70,6							
80	79,4	80,6							
90	89,3	90,7							
100	99,3	100,7							
110	109,3	110,7							
120	119,3	120,7							
130	129,2	130,8							
140	139,2	140,8							
150	149,2	150,8							
—	—	—			**Product grade B: see Table 3 or 4**				

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] Normal series in accordance with ISO 3508 ($a_{max} = 3P$).

Table 3 — Product grade B – M16×1,5 to M22×1,5

Dimensions in millimetres

Thread, $d \times P$ [a]			**M16×1,5**	(M18×2)	(M18×1,5)	**M20×2**	(M20×1,5)	(M22×2)	(M22×1,5)
a [b]		max.	4,5	6,0	4,5	6,0	4,5	6,0	4,5
		min.	1,5	2,0	1,5	2,0	1,5	2,0	1,5
c		max.	0,8	0,8	0,8	0,8	0,8	0,8	0,8
		min.	0,2	0,2	0,2	0,2	0,2	0,2	0,2
d_a		max.	17,7	20,2	20,2	22,4	22,4	24,4	24,4
d_w		min.	22,00	24,85	24,85	27,70	27,70	31,35	31,35
e		min.	26,17	29,56	29,56	32,95	32,95	37,29	37,29
k		nom.	10	11,5	11,5	12,5	12,5	14	14
		max.	10,29	11,85	11,85	12,85	12,85	14,35	14,35
		min.	9,71	11,15	11,15	12,15	12,15	13,65	13,65
k_w		min.	6,80	7,81	7,81	8,51	8,51	9,56	9,56
r		min.	0,6	0,6	0,6	0,8	0,8	0,8	0,8
s	nom. =	max.	24,00	27,00	27,00	30,00	30,00	34,00	34,00
		min.	23,16	26,16	26,16	29,16	29,16	33,00	33,00
l			**Range of standardised lengths between the stepped discontinuous lines**						
nom.	min.	max.							
—	—	—			**Product grade A: see Tables 1or 2**				
160	158,0	162,0							
180	178,0	182,0							
200	197,7	202,3							
—	—	—	**Lengths to be agreed between the purchaser and the manufacturer**						

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] Unlike ISO 3508, $a_{max} = 3P$.