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

Fixations — Vis à tête hexagonale entièrement filetées, à pas fin — Grades A et B

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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 of 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 www.iso.org/iso/foreword.html.

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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, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 185, *Fasteners*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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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 information in a reliable manner (no risk of picking the wrong dimension), see Clause 4 and Annex A;

— the rules for the shortest and greatest standard lengths have been added, and they have been amended accordingly (shortest lengths erroneously published with l_{nom} = 40 mm in the version of 2011 have been restored for M22×2, M30×2 and M36×3); standard greatest lengths have been limited to 200 mm (longer lengths are to be agreed between the purchaser and the manufacturer);

— for steel screws, property class 5.6 has been deleted and property class 12.9/12.9 has been added;

— for stainless steel screws, grades D4 and D6 and property class 80 have been added;

— non-ferrous metal screws have been deleted;

— 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.

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

ISO 888, *Fasteners — Bolts, screws and studs — Nominal lengths and thread lengths*

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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*

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

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Fasteners — Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs with specified grades and 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 8991, *Designation system for fasteners*

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 https://www.iso.org/obp

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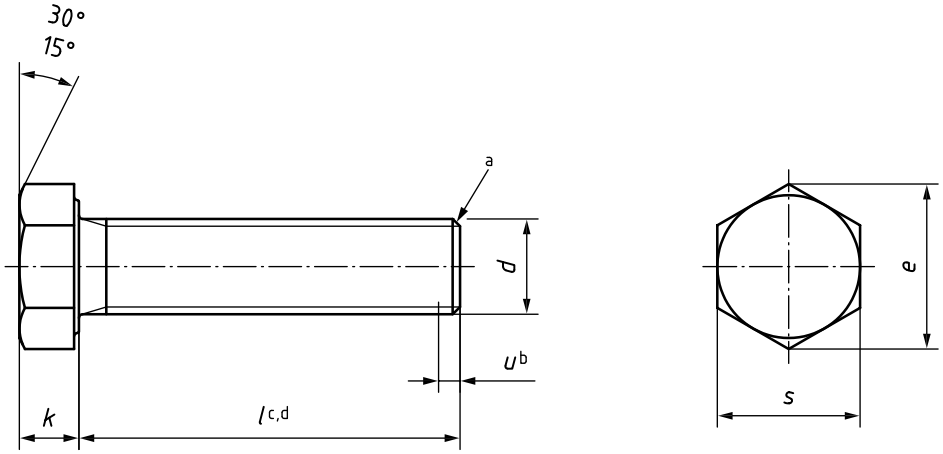
— IEC Electropedia: available at https://www.electropedia.org/

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.



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.

c Shortest standard length l_{nom} determined with $2d$ and rounded (if necessary) to the nearest standard length; shortest standard length l_{nom} = 120 mm for M64.

d Greatest standard length $l_{nom} \leq 10d$ or 200 mm, whichever is the shorter.

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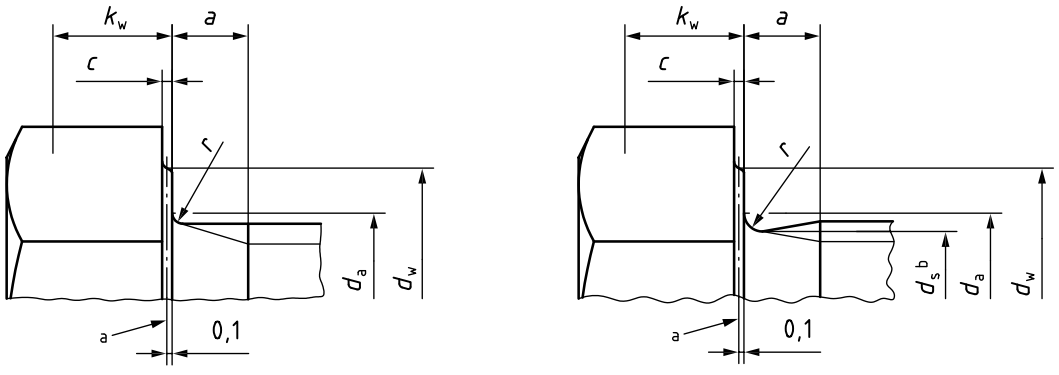
Figure 1 — Hexagon head screw

Dimensions in millimetres



a Reference datum for d_w.

b $d_s \approx$ pitch diameter.

Figure 2 — Head details and permissible shapes

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Table 1 — Dimensions for product grade A – 8 mm to 16 mm

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 standard lengths between the stepped bold lines
nom.	min.	max.	
16	15,65	16,35	
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	
140	139,2	140,8	
150	149,2	150,8	
> 150			

Screws with too short lengths

Product grade B (see Annex A)

c

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NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

[c] Product grade B, see Table 3.

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Table 2 — Dimensions for product grade A – 18 mm to 24 mm

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 standard lengths between the stepped bold lines**					
nom.	min.	max.						
35	34,5	35,5						**Screws with too short lengths**
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						
> 150			**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] $a_{max} = 3P$ and $a_{min} = 1P$.

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Table 3 — Dimensions for product grade B – 16 mm to 22 mm

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 nom.	l min.	l max.	**Range of standard lengths between the stepped bold lines**					
≤ 150			**Product grade A: see Table 1 or Table 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 in accordance with ISO 888**					
> 200								[c]

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NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

[c] Bolts specified in ISO 8765, or screws with lengths to be agreed between the purchaser and the manufacturer in accordance with ISO 888.

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Table 4 — Dimensions for product grade B – 24 mm to 42 mm

Dimensions in millimetres

Thread, $d \times P$ [a]		**M24×2**	(M27×2)	**M30×2**	(M33×2)	**M36×3**	(M39×3)	**M42×3**
a [b]	max.	6,0	6,0	6,0	6,0	9,0	9,0	9,0
	min.	2,0	2,0	2,0	2,0	3,0	3,0	3,0
c	max.	0,8	0,8	0,8	0,8	0,8	1,0	1,0
	min.	0,2	0,2	0,2	0,2	0,2	0,3	0,3
d_a	max.	26,4	30,4	33,4	36,4	39,4	42,4	45,6
d_w	min.	33,25	38,00	42,75	46,55	51,11	55,86	59,95
e	min.	39,55	45,20	50,85	55,37	60,79	66,44	71,30
k	nom.	15	17	18,7	21	22,5	25	26
	max.	15,35	17,35	19,12	21,42	22,92	25,42	26,42
	min.	14,65	16,65	18,28	20,58	22,08	24,58	25,58
k_w	min.	10,26	11,66	12,80	14,41	15,46	17,21	17,91
r	min.	0,8	1,0	1,0	1,0	1,0	1,0	1,2
s	nom. = max.	36,00	41,00	46,00	50,00	55,00	60,00	65,00
	min.	35,00	40,00	45,00	49,00	53,80	58,80	63,10

l			**Range of standard lengths between the stepped bold lines**					
nom.	min.	max.						
55	53,5	56,5						
60	58,5	61,5						
65	63,5	66,5						
70	68,5	71,5						
80	78,5	81,5						
90	88,25	91,75						
100	98,25	101,75						
110	108,25	111,75						
120	118,25	121,75						
130	128,0	132,0						
140	138,0	142,0						
150	148,0	152,0						
160	158,0	162,0						
180	178,0	182,0						
200	197,7	202,3						
> 200			**Bolts specified in ISO 8765, or screws with lengths to be agreed between the purchaser and the manufacturer in accordance with ISO 888**					

Product grade A: see Table 2

Screws with too short lengths

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NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] $a_{max} = 3P$ and $a_{min} = 1P$.

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