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Hexagon head bolts with metric fine pitch thread - Product grades A and B (ISO/DIS 8765:2020)

Sechskantschrauben mit Schaft und metrischem Feingewinde - Produktklassen A und B (ISO/DIS 8765:2020)

Vis à tête hexagonale à filetage métrique à pas fin partiellement filetées - Grades A et B (ISO/DIS 8765:2020)

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

Vis à tête hexagonale à filetage métrique à pas fin partiellement filetées — 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).

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).

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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*.

This fourth edition cancels and replaces the third edition (ISO 8765:2011), 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);

— new size M18×2 has been introduced in Table 2 including all respective dimensions;

— standard lengths have been corrected: addition of l_{nom} = 90 mm for M24×2, 180 mm for M48×3, 500 mm for M52×4, 240 mm for M64×4 and deletion of l_{nom} = 440 mm for M42×3;

— $d_{w,min}$ for M14×1,5 was corrected to 19,64 mm;

— non-ferrous metal bolts have been deleted;

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

— specificatuions 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 bolts with metric fine pitch thread — Product grades A and B

1 Scope

This document specifies the characteristics of hexagon head bolts, 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 262, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*

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, *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 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:

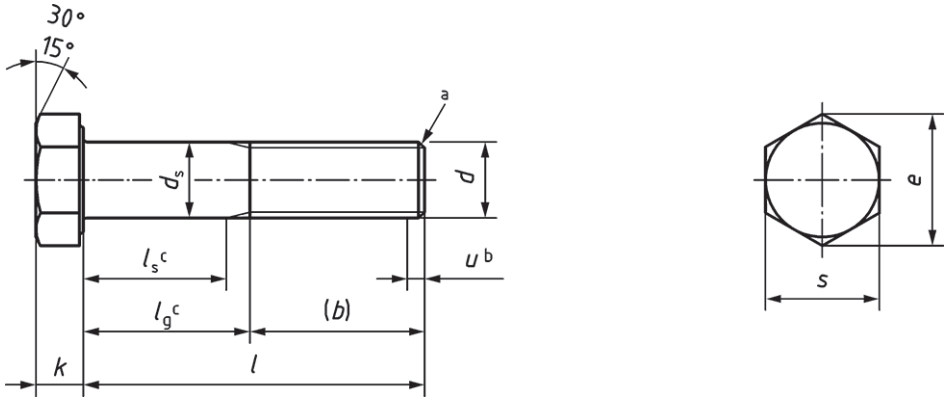
— ISO Online browsing platform: available at https://www.iso.org/obp

— 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

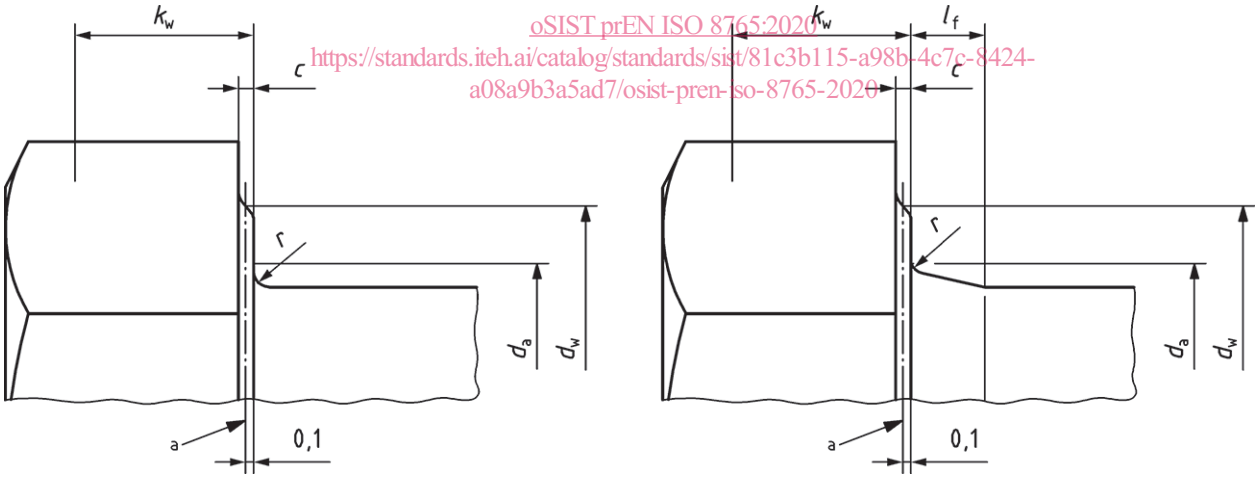
a Chamfered end (CH) in accordance with ISO 4753.

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

c $l_{g,max} = l_{nom} - b$ and $l_{s,min} = l_{g,max} - 5P$, where the P is the coarse pitch thread in accordance with ISO 262.

Figure 1 — Hexagon head bolt

Dimensions in millimetres



a) Minimum underhead fillet **b) Maximum underhead fillet**

Key

a Reference datum for d_w.

Figure 2 — Head details and permissible shapes

Table 1 — Dimensions for 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
b	ref.	b	22	26	26	30	30	34	38
		c	—	—	—	—	—	40	44
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_s	nom. =	max.	8,00	10,00	10,00	12,00	12,00	14,00	16,00
		min.	7,78	9,78	9,78	11,73	11,73	13,73	15,73
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
l_f		max.	2	2	2	3	3	3	3
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.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.
40	39,5	40,5	11,75	18,0									Fully threaded screws specified in ISO 8676			
45	44,5	45,5	16,75	23,0	11,5	19,0	11,5	19,0								
50	49,5	50,5	21,75	28,0	16,5	24,0	16,5	24,0	11,25	20,0	11,25	20,0				
55	54,4	55,6	26,75	33,0	21,5	29,0	21,5	29,0	16,25	25,0	16,25	25,0				
60	59,4	60,6	31,75	38,0	26,5	34,0	26,5	34,0	21,25	30,0	21,25	30,0	16,0	26,0		
65	64,4	65,6	36,75	43,0	31,5	39,0	31,5	39,0	26,25	35,0	26,25	35,0	21,0	31,0	17,0	27,0
70	69,4	70,6	41,75	48,0	36,5	44,0	36,5	44,0	31,25	40,0	31,25	40,0	26,0	36,0	22,0	32,0
80	79,4	80,6	51,75	58,0	46,5	54,0	46,5	54,0	41,25	50,0	41,25	50,0	36,0	46,0	32,0	42,0
90	89,3	90,7			56,5	64,0	56,5	64,0	51,25	60,0	51,25	60,0	46,0	56,0	42,0	52,0
100	99,3	100,7			66,5	74,0	66,5	74,0	61,25	70,0	61,25	70,0	56,0	66,0	52,0	62,0
110	109,3	110,7							71,25	80,0	71,25	80,0	66,0	76,0	62,0	72,0
120	119,3	120,7							81,25	90,0	81,25	90,0	76,0	86,0	72,0	82,0
130	129,2	130,8		Lengths to be agreed between the purchaser and the manufacturer									80,0	90,0	76,0	86,0
140	139,2	140,8											90,0	100,0	86,0	96,0
150	149,2	150,8													96,0	106,0

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] For $l_{nom} \leq 125$ mm.

[c] For 125 mm < $l_{nom} \leq 200$ mm.

Table 2 — Dimensions for 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**
b	ref.	[a]	42	42	46	46	50	50	54
		[b]	48	48	52	52	56	56	60
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_s	nom. =	max.	18,00	18,00	20,00	20,00	22,0	22,0	24,00
		min.	17,73	17,73	19,67	19,67	21,67	21,67	23,67
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
l_f		max.	3	3	4	4	4	4	4
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 standardized lengths between the stepped discontinuous lines**													
nom.	min.	max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.	l_s min.	l_g max.
70	69,4	70,6	15,5	28,0	15,5	28,0						**Fully threaded screws specified in ISO 8676**				
80	79,4	80,6	25,5	38,0	25,5	38,0	21,5	34,0	21,5	34,0						
90	89,3	90,7	35,5	48,0	35,5	48,0	31,5	44,0	31,5	44,0	27,5	40,0	27,5	40,0	21,0	36,0
100	99,3	100,7	45,5	58,0	45,5	58,0	41,5	54,0	41,5	54,0	37,5	50,0	37,5	50,0	31,0	46,0
110	109,3	110,7	55,5	68,0	55,5	68,0	51,5	64,0	51,5	64,0	47,5	60,0	47,5	60,0	41,0	56,0
120	119,3	120,7	65,5	78,0	65,5	78,0	61,5	74,0	61,5	74,0	57,5	70,0	57,5	70,0	51,0	66,0
130	129,2	130,8	69,5	82,0	69,5	82,0	65,5	78,0	65,5	78,0	61,5	74,0	61,5	74,0	55,0	70,0
140	139,2	140,8	79,5	92,0	79,5	92,0	75,5	88,0	75,5	88,0	71,5	84,0	71,5	84,0	65,0	80,0
150	149,2	150,8	89,5	102,0	89,5	102,0	85,5	98,0	85,5	98,0	81,5	94,0	81,5	94,0	75,0	90,0
160	—	—	**Product grade B: see Table 3**													

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

[b] For $l_{nom} \leq 125$ mm.

[c] For 125 mm < $l_{nom} \leq 200$ mm.