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Hexagon head screws — Product grade C

Vis à tête hexagonale entièrement filetées — Grade C

ICS: 21.060.10

IMPORTANT — Please use this updated version dated 2020-05-04, and discard any previous versions of this DIS.

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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).

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*.

This fifth edition cancels and replaces the fourth edition (ISO 4018:2011), which has been technically revised.

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

— M7 has been added;

— tables for dimensions have been restructured;

— $d_{w,min}$ has been changed for M5 from s_{min} – IT16 to s_{min} – IT15, as for hexagon head screws of product grades A and B;

— standard smallest length has been corrected by deleting l_{nom} = 120 mm for M64;

— standard greatest lengths (accidentally removed in the fourth edition for M10 and above) have been restored (greatest lengths l_{nom} = 10d or 200 mm whichever is the shorter);

— specifications for marking and labelling were 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 — Product grade C

1 Scope

This document specifies the characteristics of hexagon head screws, in steel, with metric coarse pitch threads M5 to M64, and with product grade C.

NOTE If in certain cases other specifications are requested, property classes can be selected from ISO 898-1, 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 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 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

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

ISO 10684, *Fasteners — Hot dip galvanised coatings*

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:

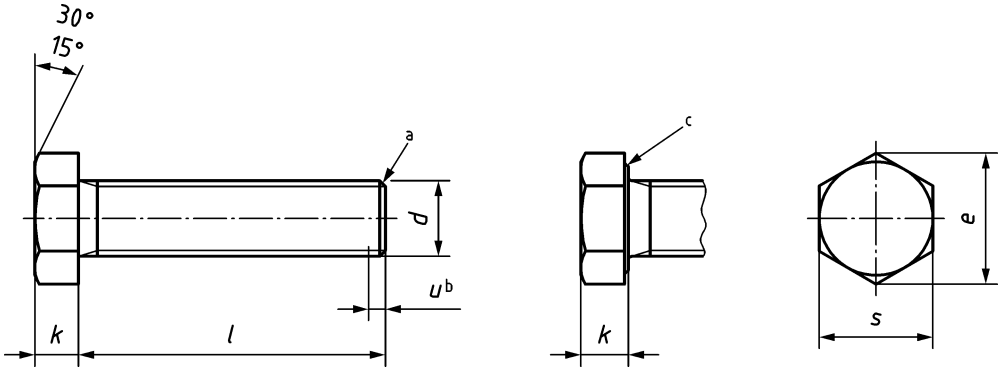
— ISO Online browsing platform: available at http://www.iso.org/obp

— 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 3.

Symbols and descriptions of dimensions are defined in ISO 225.



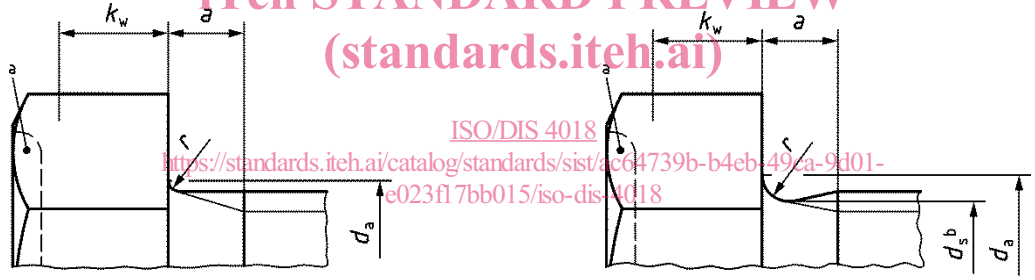
Key

a Thread end at the discretion of the manufacturer, in accordance with ISO 4753.

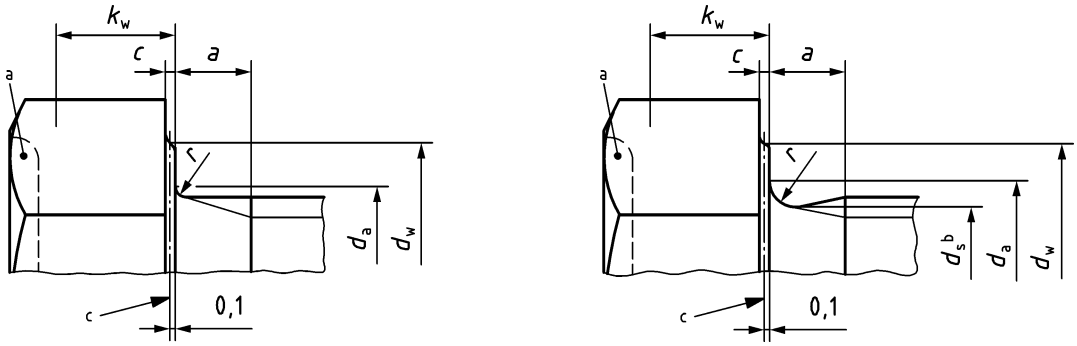
b Incomplete thread $u \leq 2P$.

c Washer face at the discretion of the manufacturer, in accordance with Figure 2 b).

Figure 1 — Hexagon head screw



a) Without washer face



b) With washer face

Key

a Indentation at the discretion of the manufacturer, within a maximum diameter of 0,8s and a maximum depth of 0,2k.

c $d_s \approx$ pitch diameter.

d Reference datum for d_w.

Figure 2 — Head details and permissible shapes

Table 1 — Dimensions – M5 to M16

Dimensions in millimetres

Thread, d			M5	M6	(M7)	M8	M10	M12	(M14)	M16
P [a]			0,8	1	1	1,25	1,5	1,75	2	2
a [b]		max.	2,40	3,00	3,00	3,75	4,50	5,25	6,00	6,00
		min.	0,80	1,00	1,00	1,25	1,50	1,75	2,00	2,00
c		max.	0,5	0,5	0,6	0,6	0,6	0,6	0,6	0,8
d_a		max.	6,0	7,2	8,2	10,2	12,2	14,7	16,7	18,7
d_w		min.	7,06	8,74	9,47	11,47	14,47	16,47	19,15	22,00
e		min.	8,63	10,89	11,94	14,20	17,59	19,85	22,78	26,17
k		nom.	3,5	4	4,8	5,3	6,4	7,5	8,8	10
		max.	3,875	4,375	5,175	5,675	6,85	7,95	9,25	10,75
		min.	3,125	3,625	4,425	4,925	5,95	7,05	8,35	9,25
k_w		min.	2,19	2,54	3,10	3,45	4,17	4,94	5,85	6,48
r		min.	0,20	0,25	0,25	0,4	0,4	0,6	0,6	0,6
s	nom. =	max.	8,00	10,00	11,00	13,00	16,00	18,00	21,00	24,00
		min.	7,64	9,64	10,57	12,57	15,57	17,57	20,16	23,16

l			Range of standardized lengths between the stepped discontinuous lines
nom.	min.	max.	
10	9,25	10,75	
12	11,10	12,90	
16	15,10	16,90	
20	18,95	21,05	
25	23,95	26,05	
30	28,95	31,05	
35	33,75	36,25	
40	38,75	41,25	
45	43,75	46,25	
50	48,75	51,25	
55	53,50	56,50	
60	58,50	61,50	
65	63,50	66,50	
70	68,50	71,50	
80	78,50	81,50	
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	156,0	164,0	

Screws with too short length

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, $a_{max} = 3P$.

Table 2 — Dimensions – M18 to M36

Thread, d		(M18)	**M20**	(M22)	**M24**	(M27)	**M30**	(M33)	**M36**
P [a]		2,5	2,5	2,5	3	3	3,5	3,5	4
a [b]	max.	7,5	7,5	7,5	9,0	9,0	10,5	10,5	12,0
	min.	2,5	2,5	2,5	3,0	3,0	3,5	3,5	4,0
c	max.	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
d_a	max.	21,2	24,4	26,4	28,4	32,4	35,4	38,4	42,4
d_w	min.	24,85	27,70	31,35	33,25	38,00	42,75	46,55	51,11
e	min.	29,56	32,95	37,29	39,55	45,20	50,85	55,37	60,79
k	nom.	11,5	12,5	14	15	17	18,7	21	22,5
	max.	12,40	13,40	14,90	15,90	17,90	19,75	22,05	23,55
	min.	10,60	11,60	13,10	14,10	16,10	17,65	19,95	21,45
k_w	min.	7,42	8,12	9,17	9,87	11,27	12,36	13,97	15,02
r	min.	0,6	0,8	0,8	0,8	1,0	1,0	1,0	1,0
s nom. =	max.	27,00	30,00	34,00	36,00	41,0	46,0	50,0	55,0
	min.	26,16	29,16	33,00	35,00	40,0	45,0	49,0	53,8

l nom.	l min.	l max.	**Range of standardized lengths between the stepped discontinuous lines**
35	33,75	36,25	
40	38,75	41,25	
45	43,75	46,25	
50	48,75	51,25	
55	53,50	56,50	
60	58,50	61,50	
65	63,50	66,50	
70	68,50	71,50	
80	78,50	81,50	
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	156,0	164,0	
180	176,0	184,0	
200	195,4	204,6	
—	—	—	**Lengths to be agreed between the purchaser and the manufacturer**

Screws with too short length

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

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

Table 3 — Dimensions – M39 to M64

Dimensions in millimetres

Thread, d		(M39)	**M42**	(M45)	**M48**	(M52)	**M56**	(M60)	**M64**
P [a]		4	4,5	4,5	5	5	5,5	5,5	6
a [b]	max.	12,0	13,5	13,5	15,0	15,0	16,5	16,5	18,0
	min.	4,0	4,5	4,5	5,0	5,0	5,5	5,5	6,0
c	max.	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
d_a	max.	45,4	48,6	52,6	56,6	62,6	67,0	71,0	75,0
d_w	min.	55,86	59,95	64,70	69,45	74,20	78,66	83,41	88,16
e	min.	66,44	71,30	76,95	82,60	88,25	93,56	99,21	104,86
k	nom.	25	26	28	30	33	35	38	40
	max.	26,05	27,05	29,05	31,05	34,25	36,25	39,25	41,25
	min.	23,95	24,95	26,95	28,95	31,75	33,75	36,75	38,75
k_w	min.	16,77	17,47	18,87	20,27	22,23	23,63	25,73	27,13
r	min.	1,0	1,2	1,2	1,6	1,6	2,0	2,0	2,0
s nom. =	max.	60,0	65,0	70,0	75,0	80,0	85,0	90,0	95,0
	min.	58,8	63,1	68,1	73,1	78,1	82,8	87,8	92,8

l			**Range of standardized lengths between the stepped discontinuous lines**
nom.	min.	max.	
80	78,50	81,50	
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	156,0	164,0	
180	176,0	184,0	
200	195,4	204,6	
—	—	—	**Lengths to be agreed between the purchaser and the manufacturer**

Screws with too short length

NOTE Sizes shown in brackets are non-preferred diameters.

[a] P is the pitch of the thread.

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

5 Requirements and reference International Standards

The requirements specified in the International standards listed in Table 4 shall apply.

Table 4 — Requirements and reference International Standards

Material		**Steel**	
General requirements	International Standard	ISO 8992	
Thread	Tolerance class	8g [a]	
	International Standard	ISO 965-1	
Mechanical properties	Property class Symbol	M5 ≤ d ≤ M39	4.6, 4.8
		d > M39	As agreed
	International Standard	ISO 898-1	
Tolerances	Product grade	C (except for size M5 where $d_{w,min} = s_{min}$ – IT15)	
	International Standard	ISO 4759-1	
Finish – Coating		As processed (no coating) Electroplated coatings as specified in ISO 4042 Non-electrolytically applied zinc flake coatings as specified in ISO 10683 Hot dip galvanized coatings as specified in ISO 10684 Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser	
Surface integrity		Limits for surface discontinuities as specified in ISO 6157-1	
Acceptability		Acceptance inspection as specified in ISO 3269	

[a] Depending on the type of coating to be applied, another tolerance position of the thread may be specified for the uncoated fastener in accordance with the relevant coating standard.

6 Marking and labelling

6.1 Marking on product

Marking shall be as specified in ISO 898-1.

6.2 Labelling on package

Labelling on the package shall be in accordance with ISO 898-1, and shall content at least:

— the reference to this document, i.e. ISO 4018,

— the thread size d and nominal length l,

— the symbol of the property class,

— the type of "Finish – Coating",

— the manufacturer's and/or distributor's name,

— the manufacturing lot number as specified in ISO 1891-4,

— the quantity of pieces in the package.

