SLOVENSKI STANDARD
oSIST prEN ISO 4016 rev:2020

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Vijaki s šestrobo glavo - Razred izdelave C (ISO/DIS 4016:2020)

Hexagon head bolts - Product grade C (ISO/DIS 4016:2020)

Sechskantschrauben mit Schaft - Produktklasse C (ISO/DIS 4016:2020)

Vis à tête hexagonale partiellement filetées - Grade C (ISO/DIS 4016:2020)

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Hexagon head bolts — Product grade C

Vis à tête hexagonale partiellement 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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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

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 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 4016:2011), 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 bolts of product grades A and B;

— standard lengths have been corrected: addition of l_{nom} = 50 mm forM12, 70 mm for M18, 90 mm for M24, 100 mm for M27, 160 mm for M42, 180 mm for M48, 220 mm forM56, 240 mm for M64 and deletion of l_{nom} = 400 for M39;

— $l_{g,max}$ has been corrected for M33 × 260 (169 mm instead of 167 mm),

— 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 bolts — Product grade C

1 Scope

This document specifies the characteristics of hexagon head bolts, 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:

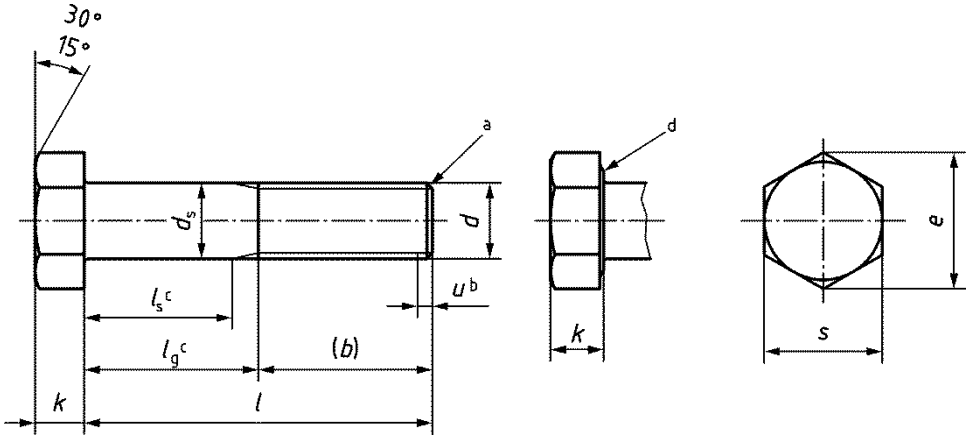
— ISO Online browsing platform: available at http://www.iso.org/obp

— 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 4.

Symbols and descriptions of dimensions are defined in ISO 225.



Key

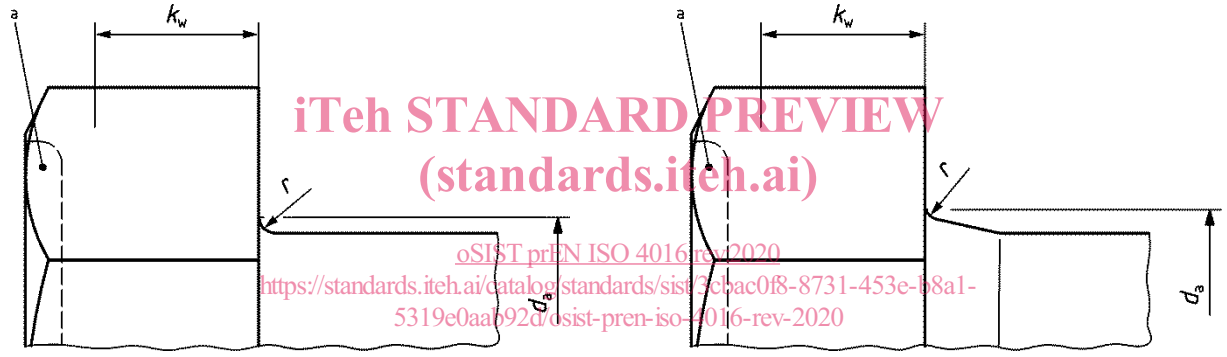
a End at the discretion of the manufacturer, in accordance with ISO 4753.

b Incomplete thread $u \leq 2P$.

c $l_{g,max} = l_{nom} - b$ and $l_{s,min} = l_{g,max} - 5P$.

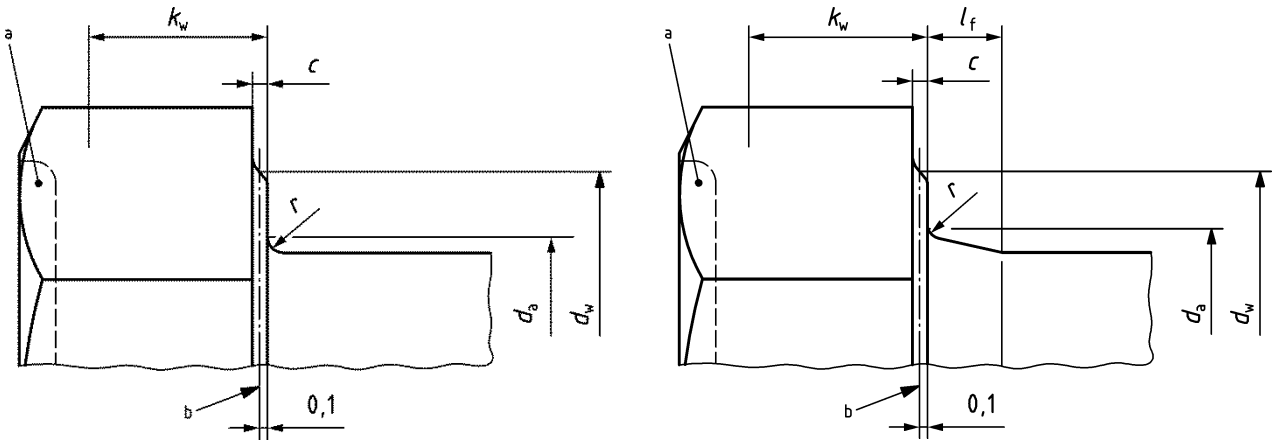
d Washer face at the discretion of the manufacturer.

Figure 1 — Hexagon head bolt



a) Minimum underhead fillet

b) Maximum underhead fillet



c) Minimum underhead fillet with washer face

d) Maximum underhead fillet with washer face

Key

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

b Reference datum for d_w.

Figure 2 — Head details and permissible shapes

Table 1 — Dimensions – M5 to M12

Dimensions in millimetres

Thread, *d*			**M5**	**M6**	(M7)	**M8**	**M10**	**M12**
P [a]			0,8	1	1	1,25	1,5	1,75
b	ref.	[b]	16	18	20	22	26	30
c		max.	0,5	0,5	0,6	0,6	0,6	0,6
d_a		max.	6,0	7,2	8,2	10,2	12,2	14,7
d_s		max.	5,48	6,48	7,58	8,58	10,58	12,7
		min.	4,52	5,52	6,42	7,42	9,42	11,3
d_w		min.	7,06	8,74	9,47	11,47	14,47	16,47
e		min.	8,63	10,89	11,94	14,20	17,59	19,85
k		nom.	3,5	4,0	4,8	5,3	6,4	7,5
		max.	3,875	4,375	5,175	5,675	6,85	7,95
		min.	3,125	3,625	4,425	4,925	5,95	7,05
k_w		min.	2,19	2,54	3,10	3,45	4,17	4,94
r		min.	0,20	0,25	0,25	0,40	0,40	0,60
s	nom. =	max.	8,00	10,00	11,00	13,00	16,00	18,00
		min.	7,64	9,64	10,57	12,57	15,57	17,57

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.
25	23,95	26,05	5,0	9,0										
30	28,95	31,05	10,0	14,0	7,0	12,0								
35	33,75	36,25	15,0	19,0	12,0	17,0	10,0	15,0						
40	38,75	41,25	20,0	24,0	17,0	22,0	15,0	20,0	11,75	18,0				
45	43,75	46,25	25,0	29,0	22,0	27,0	20,0	25,0	16,75	23,0	11,5	19,0		
50	48,75	51,25	30,0	34,0	27,0	32,0	25,0	30,0	21,75	28,0	16,5	24,0	11,25	20,0
55	53,50	56,50			32,0	37,0	30,0	35,0	26,75	33,0	21,5	29,0	16,25	25,0
60	58,50	61,50			37,0	42,0	35,0	40,0	31,75	38,0	26,5	34,0	21,25	30,0
65	63,50	66,50					40,0	45,0	36,75	43,0	31,5	39,0	26,25	35,0
70	68,50	71,50					45,0	50,0	41,75	48,0	36,5	44,0	31,25	40,0
80	78,50	81,50							51,75	58,0	46,5	54,0	41,25	50,0
90	88,25	91,75									56,5	64,0	51,25	60,0
100	98,25	101,75									66,5	74,0	61,25	70,0
110	108,25	111,75											71,25	80,0
120	118,25	121,75											81,25	90,0

Fully threaded screws specified in ISO 4018

Lengths to be agreed between the purchaser and the manufacturer

NOTE Size shown in brackets is a non-preferred diameter.

[a] *P* is the pitch of the thread.

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

Table 2 — Dimensions – M14 to M24

Dimensions in millimetres

Thread, *d*			(M14)	**M16**	(M18)	**M20**	(M22)	**M24**
P [a]			2	2	2,5	2,5	2,5	3
b	ref.	[b]	34	38	42	46	50	54
		[c]	40	44	48	52	56	60
		[d]	—	—	—	—	69	73
c		max.	0,6	0,8	0,8	0,8	0,8	0,8
d_a		max.	16,7	18,7	21,2	24,4	26,4	28,4
d_s		max.	14,70	16,70	18,70	20,84	22,84	24,84
		min.	13,30	15,30	17,30	19,16	21,16	23,16
d_w		min.	19,15	22,00	24,85	27,70	31,35	33,25
e		min.	22,78	26,17	29,56	32,95	37,29	39,55
k		nom.	8,8	10	11,5	12,5	14	15
		max.	9,25	10,75	12,4	13,4	14,9	15,9
		min.	8,35	9,25	10,6	11,6	13,1	14,1
k_w		min.	5,85	6,48	7,42	8,12	9,17	9,87
r		min.	0,6	0,6	0,6	0,8	0,8	0,8
s	nom. =	max.	21,00	24,00	27,00	30,00	34,00	36,00
		min.	20,16	23,16	26,16	29,16	33,00	35,00

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.
60	58,5	61,5	16,0	26,0										
65	63,5	66,5	21,0	31,0	17,0	27,0					**Fully threaded screws specified in ISO 4018**			
70	68,5	71,5	26,0	36,0	22,0	32,0	15,5	28,0						
80	78,5	81,5	36,0	46,0	32,0	42,0	25,5	38,0	21,5	34,0				
90	88,25	91,75	46,0	56,0	42,0	52,0	35,5	48,0	31,5	44,0	27,5	40,0	21,0	36,0
100	98,25	101,75	56,0	66,0	52,0	62,0	45,5	58,0	41,5	54,0	37,5	50,0	31,0	46,0
110	108,25	111,75	66,0	76,0	62,0	72,0	55,5	68,0	51,5	64,0	47,5	60,0	41,0	56,0
120	118,25	121,75	76,0	86,0	72,0	82,0	65,5	78,0	61,5	74,0	57,5	70,0	51,0	66,0
130	128,0	132,0	80,0	90,0	76,0	86,0	69,5	82,0	65,5	78,0	61,5	74,0	55,0	70,0
140	138,0	142,0	90,0	100	86,0	96,0	79,5	92,0	75,5	88,0	71,5	84,0	65,0	80,0
150	148,0	152,0			96,0	106	89,5	102	85,5	98,0	81,5	94,0	75,0	90,0
160	156,0	164,0			106	116	99,5	112	95,5	108	91,5	104	85,0	100
180	176,0	184,0					119,5	132	115,5	128	111,5	124	105	120
200	195,4	204,6		**Lengths to be agreed between the purchaser and the manufacturer**					135,5	148	131,5	144	125	140
220	215,4	224,6									138,5	151	132	147
240	235,4	244,6											152	167

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.

[d] For $l_{nom} > 200$ mm.

Table 3 — Dimensions – M27 to M42

Dimensions in millimetres

Thread, *d*			(M27)	**M30**	(M33)	**M36**	(M39)	**M42**
P [a]			3	3,5	3,5	4	4	4,5
b	ref.	[b]	60	66	—	—	—	—
		[c]	66	72	78	84	90	96
		[d]	79	85	91	97	103	109
c		max.	0,8	0,8	0,8	0,8	1,0	1,0
d_a		max.	32,4	35,4	38,4	42,4	45,4	48,6
d_s		max.	27,84	30,84	34,0	37,0	40,0	43,0
		min.	26,16	29,16	32,0	35,0	38,0	41,0
d_w		min.	38,00	42,75	46,55	51,11	55,86	59,95
e		min.	45,20	50,85	55,37	60,79	66,44	71,30
k		nom.	17	18,7	21	22,5	25	26
		max.	17,90	19,75	22,05	23,55	26,05	27,05
		min.	16,10	17,65	19,95	21,45	23,95	24,95
k_w		min.	11,27	12,36	13,97	15,02	16,77	17,47
r		min.	1,0	1,0	1,0	1,0	1,0	1,2
s	nom. =	max.	41,0	46,0	50,0	55,0	60,0	65,0
		min.	40,0	45,0	49,0	53,8	58,8	63,1

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.
100	98,25	101,75	25,0	40,0										
110	108,25	111,75	35,0	50,0										
120	118,25	121,75	45,0	60,0	36,5	54,0					**Fully threaded screws specified in ISO 4018**			
130	128,0	132,0	49,0	64,0	40,5	58,0	34,5	52,0						
140	138,0	142,0	59,0	74,0	50,5	68,0	44,5	62,0	36,0	56,0				
150	148,0	152,0	69,0	84,0	60,5	78,0	54,5	72,0	46,0	66,0	40,0	60,0		
160	156,0	164,0	79,0	94,0	70,5	88,0	64,5	82,0	56,0	76,0	50,0	70,0	41,5	64,0
180	176,0	184,0	99,0	114	90,5	108	84,5	102	76,0	96,0	70,0	90,0	61,5	84,0
200	195,4	204,6	119	134	110,5	128	104,5	122	96,0	116	90,0	110	81,5	104
220	215,4	224,6	126	141	117,5	135	111,5	129	103	123	97,0	117	88,5	111
240	235,4	244,6	146	161	137,5	155	131,5	149	123	143	117	137	108,5	131
260	254,8	265,2	166	181	157,5	175	151,5	169	143	163	137	157	128,5	151
280	274,8	285,2			177,5	195	171,5	189	163	183	157	177	148,5	171
300	294,8	305,2			197,5	215	191,5	209	183	203	177	197	168,5	191
320	314,3	325,7					211,5	229	203	223	197	217	188,5	211
340	334,3	345,7							223	243	217	237	208,5	231
360	354,3	365,7		**Lengths to be agreed between the purchaser and the manufacturer**					243	263	237	257	228,5	251
380	374,3	385,7									257	277	248,5	271
400	394,3	405,7											268,5	291
420	413,7	426,3											288,5	311

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.

[d] For $l_{nom} > 200$ mm.