



SLOVENSKI STANDARD
oSIST prEN ISO 4015:2020
01-september-2020

Vijaki s šest robo glavo z zmanjšanim stebлом (premer stebła ≈ premer navoja) - Razred izdelave B (ISO/DIS 4015:2020)

Hexagon head bolts with reduced shank (shank diameter ≈ pitch diameter) - Product grade B (ISO/DIS 4015:2020)

Sechskantschrauben mit Schaft, Dünnschaft (Schaftdurchmesser ≈ Flankendurchmesser) - Produktklasse B (ISO/DIS 4015:2020)

Vis à tête hexagonale partiellement filetées à tige réduite (diamètre de tige ≈ diamètre sur flanc de filet) - Grade B (ISO/DIS 4015:2020)

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Ta slovenski standard je istoveten z: prEN ISO 4015

ICS:

21.060.10 Sorniki, vijaki, stebelni vijaki Bolts, screws, studs

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DRAFT INTERNATIONAL STANDARD

ISO/DIS 4015

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ICS: 21.060.10

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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).

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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 second edition cancels and replaces the first edition (ISO 4015:1979), which has been technically revised.

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

- M3,5, M7 and M18 have been added;
- the indentation on the head and the washer face under the head have been left to the choice of the manufacturer, however limits for dimensions have been added;
- $d_{w,min}$ has been changed for sizes $d \leq M5$ from $s_{min} - IT16$ to $s_{min} - IT15$ in order to have a larger bearing surface area (and less contact pressure), and its values for $d > M5$ have been recalculated in accordance with ISO 4759-1 without rounding off;
- values for $k_{w,min}$ have been recalculated in accordance with ISO 4759-1 without rounding off,
- value for e_{min} has been corrected for M3;
- property class 50 has been added for stainless steel, and non-ferrous metal has 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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Hexagon head bolts with reduced shank (shank diameter \approx pitch diameter) — Product grade B

1 Scope

This document specifies the characteristics of hexagon head bolts with reduced shank (shank diameter \approx pitch diameter), in steel and stainless steel, with metric coarse pitch threads M3 to M20, and with product grade B.

NOTE 1 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.

NOTE 2 For hexagon head bolts with full shank, see ISO 4014.

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, *Fasteners — 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 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:

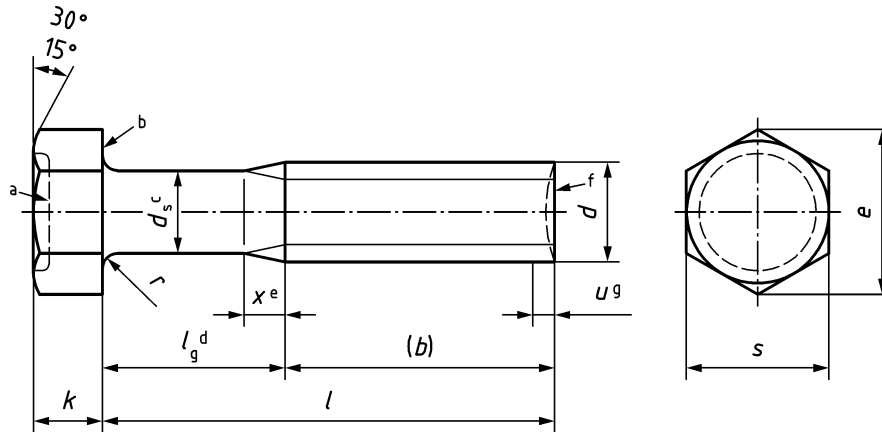
- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

ISO/DIS 4015:2020 (E)

4 Dimensions

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

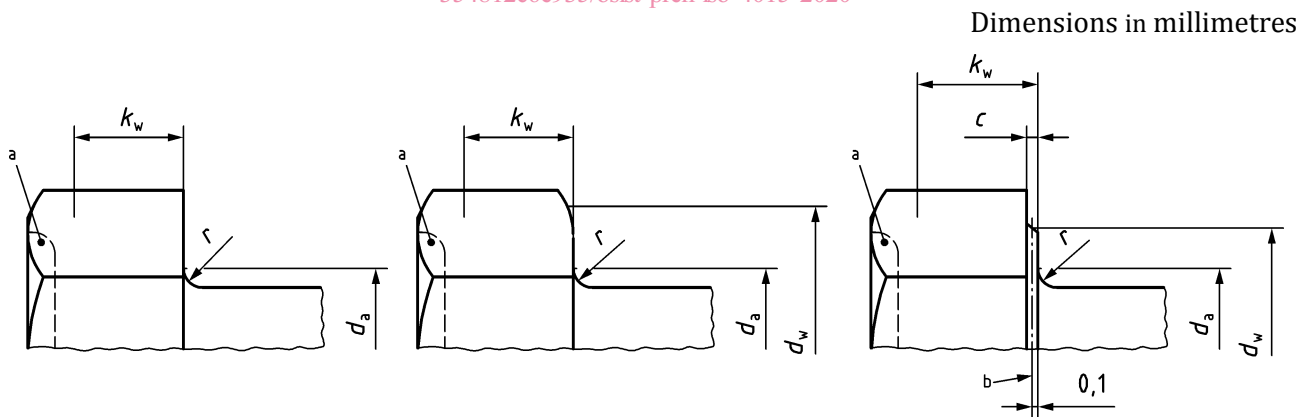
Symbols and descriptions of dimensions are defined in ISO 225.



Key

- a Indentation at the discretion of the manufacturer.
- b Shape of the bearing face at the discretion of the manufacturer, in accordance with Figure 2
- c Increase of d_s up to d within a maximum length of $0,5d$ under the head, at the discretion of the manufacturer.
- d $l_{g,max} = l_{nom} - b_{ref}$ and $l_{g,min} = l_{g,max} - 2P$.
- e $x = 2,5P$.
- f As-rolled end (RL) or at the discretion of the manufacturer, in accordance with ISO 4753.
- g Incomplete thread $u \leq 2P$.

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Figure 1 — Hexagon head bolt



Key

- a Any shape for the indentation within a maximum diameter of $0,8s$ and a maximum depth of $0,2k$.
- b Reference datum for d_w .

Figure 2 — Head details and permissible shapes

Table 1 — Dimensions - M3 to M8

Dimensions in millimetres

Thread, <i>d</i>			M3	(M3,5)	M4	M5	M6	(M7)	M8							
<i>P</i> ^a			0,5	0,6	0,7	0,8	1	1	1,25							
<i>b</i>	ref.	<i>b</i>	12	13	14	16	18	20	22							
		<i>c</i>	—	—	—	—	—	—	28							
<i>c</i>		max.	0,4	0,4	0,4	0,5	0,5	0,6	0,6							
<i>d</i> _a		max.	3,6	4,1	4,7	5,7	6,8	7,8	9,2							
<i>d</i> _s		≈	2,60	3,05	3,50	4,40	5,30	6,20	7,10							
<i>d</i> _w		min.	4,72	5,22	6,06	7,06	8,74	9,47	11,47							
<i>e</i>		min.	5,88	6,44	7,50	8,63	10,89	11,94	14,20							
		nom.	2	2,4	2,8	3,5	4	4,8	5,3							
		max.	2,20	2,60	3,00	3,74	4,24	5,04	5,54							
		min.	1,80	2,20	2,60	3,26	3,76	4,56	5,06							
<i>k</i> _w		min.	1,26	1,54	1,82	2,28	2,63	3,19	3,54							
<i>r</i>		min.	0,10	0,10	0,20	0,20	0,25	0,25	0,40							
<i>s</i>		nom. = max.	5,50	6,00	7,00	8,00	10,00	11,00	13,00							
		min.	5,20	5,70	6,64	7,64	9,64	10,57	12,57							
<i>x</i>		max.	1,25	1,50	1,75	2,00	2,50	2,50	3,20							
Range of standardized lengths between the stepped discontinuous lines																
<i>l</i>			<i>l</i> _g		<i>l</i> _g		<i>l</i> _g		<i>l</i> _g		<i>l</i> _g		<i>l</i> _g		<i>l</i> _g	
nom.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
20	18,95	21,05	7	8	5,8	7	4,6	6	Lengths to be agreed between the purchaser and the manufacturer							
25	23,95	26,05	12	13	10,8	12	9,6	11	the manufacturer							
30	28,95	31,05	17	18	15,8	17	14,6	16	12,4	14	10	12	8	10	5,5	8
35	33,75	36,25			20,8	22	19,6	21	17,4	19	15	17	13	15	10,5	13
40	38,75	41,25					24,6	26	22,4	24	20	22	18	20	15,0	18
45	43,75	46,25							27,4	29	25	27	23	25	20,5	23
50	48,75	51,25							32,4	34	30	32	28	30	25,5	28
55	53,5	56,5			Lengths to be agreed between the purchaser and the manufacturer						35	37	33	35	30,5	33
60	58,5	61,5								40	42	38	40	35,5	38	
65	36,5	66,5											43	45	40,5	43
70	68,5	71,5											48	50	45,5	48
80	78,5	81,5													55,5	58
NOTE											Sizes shown in brackets are non-preferred diameters.					
a											<i>P</i> is the pitch of the thread.					
b											For <i>l</i> _{nom} ≤ 125 mm.					
c											For 125 mm < <i>l</i> _{nom} ≤ 200 mm.					

Table 2 — Dimensions— M10 to M20

Dimensions in millimetres

Thread, d			M10	M12	(M14)	M16	(M18)	M20						
P^a			1,5	1,75	2	2	2,5	2,5						
b	ref.	b	26	30	34	38	42	46						
		c	32	36	40	44	48	52						
c		max.	0,6	0,6	0,6	0,8	0,8	0,8						
d_a		max.	11,2	13,7	15,7	17,7	20,2	22,4						
d_s		\approx	8,9	10,7	12,5	14,5	16,3	18,2						
d_w		min.	14,47	16,47	19,15	22,00	24,85	27,70						
e		min.	17,59	19,85	22,78	26,17	29,56	32,95						
k		nom.	6,4	7,5	8,8	10,0	11,5	12,5						
		max.	6,69	7,79	9,09	10,29	11,85	12,85						
		min.	6,11	7,21	8,51	9,71	11,15	12,15						
k_w		min.	4,28	5,05	5,96	6,80	7,81	8,51						
r		min.	0,4	0,6	0,6	0,6	0,6	0,8						
s		nom. = max.	16,00	18,00	21,00	24,00	27,00	30,00						
		min.	15,57	17,57	20,16	23,16	26,16	29,16						
x		max.	3,75	4,38	5,00	5,00	6,25	6,25						
Range of standardized lengths between the stepped discontinuous lines														
l			l_g		l_g		l_g		l_g		l_g		l_g	
nom.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
40	38,75	41,25	11	14										
45	43,75	46,25	16	19	11,5	15								
50	48,75	51,25	21	24	16,5	20	12	16						
55	53,5	56,5	26	29	21,5	25	17	21	13	17				
60	58,5	61,5	31	34	26,5	30	22	26	18	22	13	18		
65	63,5	66,5	36	39	31,5	35	27	31	23	27	18	23	14	19
70	68,5	71,5	41	44	36,5	40	32	36	28	32	23	28	19	24
80	78,5	81,5	51	54	46,5	50	42	46	38	42	33	38	29	34
90	88,25	91,75	61	64	56,5	60	52	56	48	52	43	48	39	44
100	98,25	101,75	71	74	66,5	70	62	66	58	62	53	58	49	54
110	108,25	111,75			76,5	80	72	76	68	72	63	68	59	64
120	118,25	121,75			86,5	90	82	86	78	82	73	78	69	74
130	128,0	132,0	Lengths to be agreed between the purchaser and the manufacturer				86	90	82	86	77	82	73	70
140	138,0	142,0					96	100	92	96	87	92	83	88
150	148,0	152,0							102	106	97	102	93	98
NOTE Sizes shown in brackets are non-preferred diameters.														
^a P is the pitch of the thread.														
^b For $l_{\text{nom}} \leq 125$ mm.														
^c For $125 \text{ mm} < l_{\text{nom}} \leq 200$ mm.														