
**Hexagon bolts with flange — Small
series — Product grade A**

*Vis à tête hexagonale à embase cylindro-tronconique — Série étroite —
Grade A*

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 15071 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 10, *Product standards for fasteners*.

This second edition cancels and replaces the first edition (ISO 15071:1999), of which it constitutes a minor revision. It also incorporates the Technical Corrigendum ISO 15071:1999/Cor.1:2006.

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Introduction

This International Standard belongs to a complete group of product standards developed by ISO on external hexagon drive fasteners. It comprises the following:

- a) hexagon head bolts (ISO 4014, ISO 4015, ISO 4016 and ISO 8765);
- b) hexagon head screws (ISO 4017, ISO 4018 and ISO 8676);
- c) hexagon nuts (ISO 4032, ISO 4033, ISO 4034, ISO 4035, ISO 4036, ISO 7040, ISO 7041, ISO 7042, ISO 7719, ISO 7720, ISO 8673, ISO 8674, ISO 8675, ISO 10511, ISO 10512 and ISO 10513);
- d) hexagon bolts with flange (ISO 4162, ISO 15071 and ISO 15072);
- e) hexagon nuts with flange (ISO 4161, ISO 7043, ISO 7044, ISO 10663, ISO 12125, ISO 12126 and ISO 21670).

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Hexagon bolts with flange — Small series — Product grade A

1 Scope

This International Standard specifies the characteristics of hexagon bolts with flange, small series, of product grade A, with threads from M5 up to and including M16, and property classes 8.8, 9.8, 10.9 and A2-70.

If, in special cases, specifications other than those listed in this International Standard are required, they can be selected from existing International Standards, for example ISO 261, ISO 888, ISO 898-1, ISO 965-2 and ISO 3506-1.

2 Normative references

The following referenced documents are indispensable for the application 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 261, *ISO general purpose metric screw threads — General plan*

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 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs*

ISO 4042, *Fasteners — Electroplated coatings*

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 6157-3, *Fasteners — Surface discontinuities — Part 3: Bolts, screws and studs for special requirements*

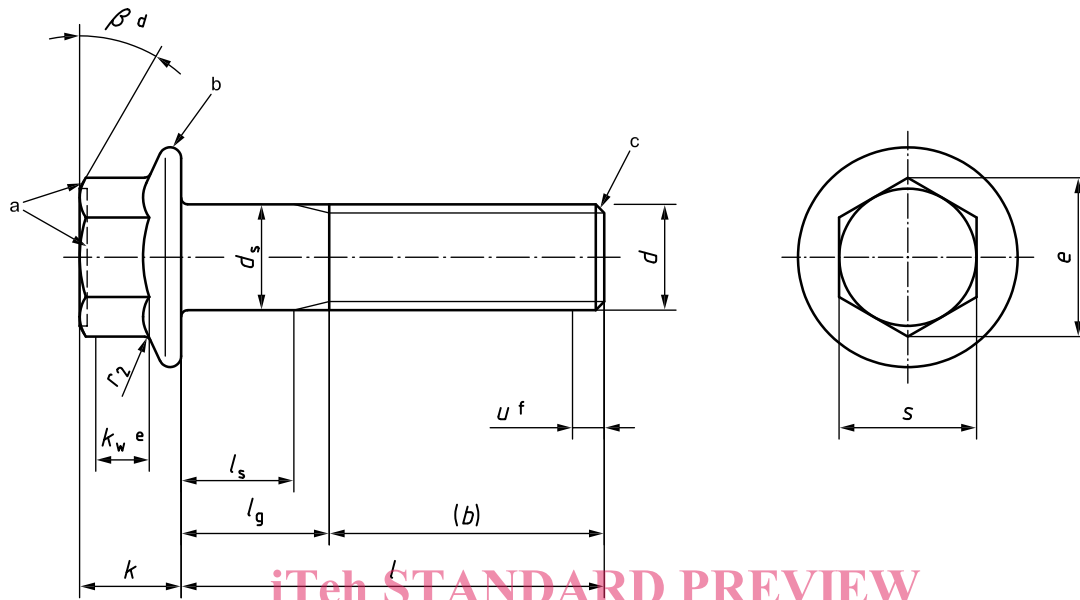
ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

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

3 Dimensions

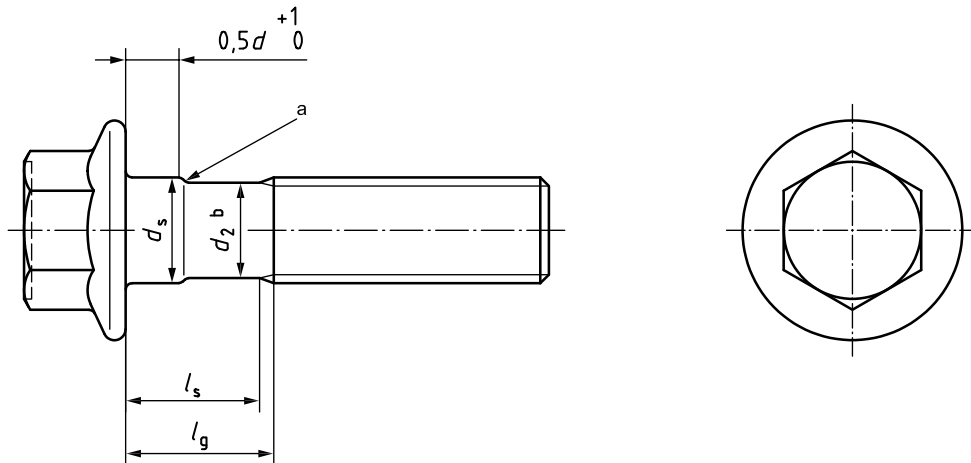
See Figures 1 to 3 and Table 1.

Symbols and descriptions of dimensions are specified in ISO 225.



- a The top of the head shall be either full form or indented at the manufacturer's discretion and shall be either chamfered or rounded. The minimum diameter of the chamfer circle or start of rounding shall be the maximum width across flats minus 15 %. If the top of the head is indented, the periphery may be rounded.
- b Contour of the edge at the discretion of the manufacturer.
- c Chamfered end (as specified in ISO 4753).
- d $\beta = 15^\circ$ to 30° .
- e k_w is the wrenching height (see Note to Table 1).
- f Incomplete thread $u \leq 2P$.

Figure 1 — Hexagon bolt with flange — Full shank — Standard type



NOTE For other dimensions, see Figure 1.

- a Rounded, chamfered or conical.
- b d_2 is approximately equal to the pitch diameter (rolling diameter).

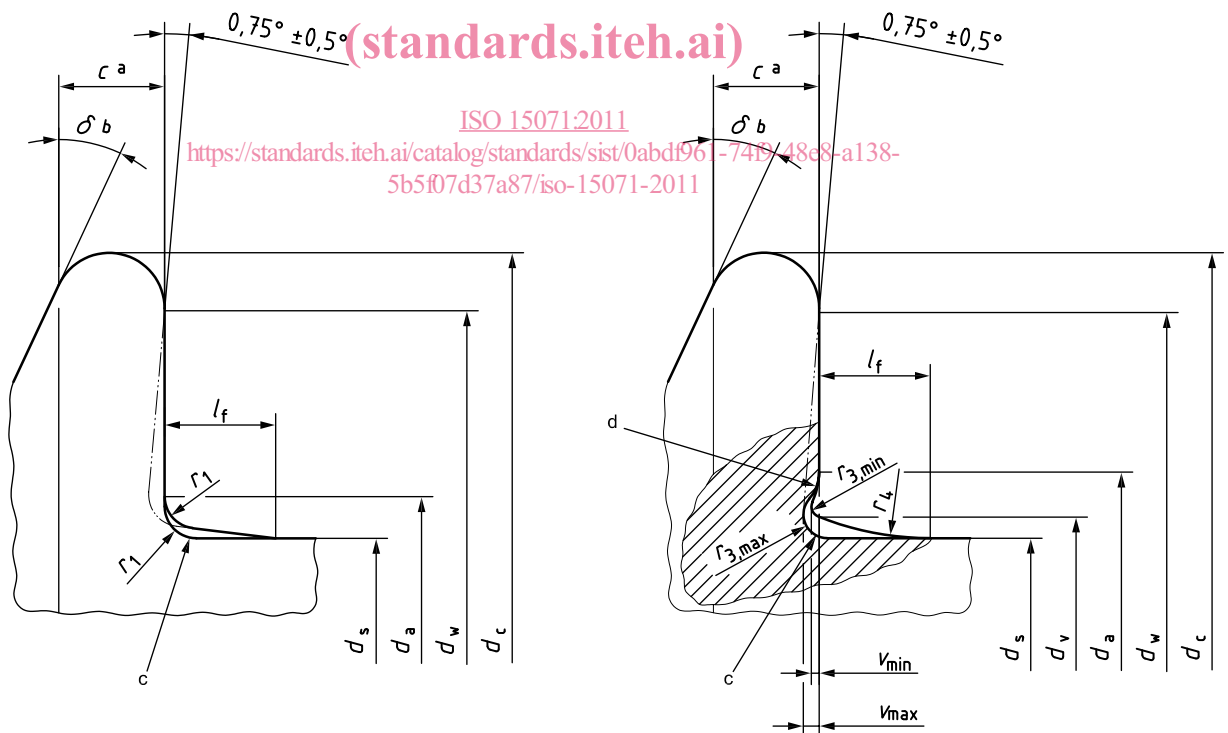
Figure 2 — Hexagon bolt with flange — Reduced shank — Type R (upon request)

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a) Type F without undercut — Standard type

b) Type U with undercut (upon request or optional)

- a c is measured at $d_{w,min}$.
- b $\delta = 15^\circ$ to 25° .
- c Maximum and minimum underhead fillet.
- d Junction of fillet with bearing surface shall be a smooth blend.

Figure 3 — Hexagon bolt with flange — Undercut profiles

Table 1 — Dimensions

Dimensions in millimetres

Thread		M5	M6	M8	M10	M12	(M14) ^a	M16
p^b		0,8	1	1,25	1,5	1,75	2	2
b ref.	c	16	18	22	26	30	34	38
	d	—	—	28	32	36	40	44
	e	—	—	—	—	—	—	57
c	min.	1	1,1	1,2	1,5	1,8	2,1	2,4
d_a Type $\frac{F}{U}$	max.	5,7	6,8	9,2	11,2	13,7	15,7	17,7
		6,2	7,5	10	12,5	15,2	17,7	20,5
d_c	max.	11,4	13,6	17	20,8	24,7	28,6	32,8
d_s	max.	5,00	6,00	8,00	10,00	12,00	14,00	16,00
	min.	4,82	5,82	7,78	9,78	11,73	13,73	15,73
d_v	max.	5,5	6,6	8,8	10,8	12,8	14,8	17,2
d_w	min.	9,4	11,6	14,9	18,7	22,5	26,4	30,6
e	min.	7,59	8,71	10,95	14,26	16,5	19,86	23,15
k	max.	5,6	6,9	8,5	9,7	12,1	12,9	15,2
k_w	min.	2,3	2,9	3,8	4,3	5,4	5,6	6,8
l_f	max.	1,4	1,6	2,1	2,1	2,1	2,1	3,2
r_1	min.	0,2	0,25	0,4	0,4	0,6	0,6	0,6
r_2^f	max.	0,3	0,4	0,5	0,6	0,7	0,9	1
r_3	max.	0,25	0,26	0,36	0,45	0,54	0,63	0,72
	min.	0,10	0,11	0,16	0,20	0,24	0,28	0,32
r_4	ref.	4	4,4	5,7	5,7	5,7	5,7	8,8
s	max.	7,00	8,00	10,00	13,00	15,00	18,00	21,00
	min.	6,78	7,78	9,78	12,73	14,73	17,73	20,67
v	max.	0,15	0,20	0,25	0,30	0,35	0,45	0,50
	min.	0,05	0,05	0,10	0,15	0,15	0,20	0,25

Table 1 (continued)

Dimensions in millimetres

Thread			M5		M6		M8		M10		M12		(M14) ^a		M16	
<i>l_{gh}</i>			<i>l_s and l_g</i>													
nom.	min.	max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.	<i>l_s</i> min.	<i>l_g</i> max.
10	9,71	10,29	—	—												
12	11,65	12,35	—	—	—	—										
16	15,65	16,35	—	—	—	—	—	—								
20	19,58	20,42	—	—	—	—	—	—	—	—						
25	24,58	25,42	5	9	—	—	—	—	—	—	—	—				
30	29,58	30,42	10	14	7	12	—	—	—	—	—	—	—	—		
35	34,5	35,5	15	19	12	17	6,75	13	—	—	—	—	—	—	—	—
40	39,5	40,5	20	24	17	22	11,75	18	6,5	14	—	—	—	—	—	—
45	44,5	45,5	25	29	22	27	16,75	23	11,5	19	6,25	15	—	—	—	—
50	49,5	50,5	30	34	27	32	21,75	28	16,5	24	11,25	20	6	16	—	—
55	54,4	55,6			32	37	26,75	33	21,5	29	16,25	25	11	21	7	17
60	59,4	60,6			37	42	31,75	38	26,5	34	21,25	30	16	26	12	22
65	64,4	65,6					36,75	43	31,5	39	26,25	35	21	31	17	27
70	69,4	70,6					41,75	48	36,5	44	31,25	40	26	36	22	32
80	79,4	80,6					51,75	58	46,5	54	41,25	50	36	46	32	42
90	89,3	90,7					56,5	64	51,25	60	51,25	60	46	56	42	52
100	99,3	100,7							66,5	74	61,25	70	56	66	52	62
110	109,3	110,7									71,25	80	66	76	62	72
120	119,3	120,7									81,25	90	76	86	72	82
130	129,2	130,8											80	90	76	86
140	139,2	140,8											90	100	86	96
150	149,2	150,8													96	106
160	159,2	160,8													106	116

NOTE If the product passes the gauging in Annex A, the requirements for dimensions *c*, *e* and *k_w* are satisfied.

a The size in parentheses should be avoided, if possible.

b *P* is the pitch of the thread.

c For *l_{nom}* ≤ 125 mm.

d For 125 mm < *l_{nom}* ≤ 200 mm.

e For *l_{nom}* > 200 mm.

f Radius *r₂* is applicable both at the corners and at the flats of the hexagon.

g Screws with non-specified dimensions, *l_s* and *l_g*, given as "—", shown above the solid, bold, stepped line are threaded to the head.

h Reduced shank type (type R) only below the dashed stepped line.