
Hexagon socket button head screws

Vis à tête cylindrique bombée plate à six pans creux

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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.

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 7380 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

This third edition cancels and replaces the second edition (ISO 7380:1997), which has been technically revised.

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Hexagon socket button head screws

1 Scope

This International Standard specifies the characteristics of hexagon socket button head screws with threads from M3 up to and including M16, with product grade A.

NOTE Particular attention is drawn to the note in Table 2 and to Table 3 concerning the limitation on ultimate tensile load.

If, in special cases, specifications other than those listed in this International Standard are required, they should be selected from existing International Standards, e.g. ISO 261, ISO 888, ISO 898-1, ISO 965-2 and ISO 4759-1.

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 designations of dimensions*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 888, *Bolts, screws and studs — Nominal lengths, and thread lengths for general purpose bolts*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs*

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 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

ISO 3269, *Fasteners — Acceptance inspection*

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 6157-1, *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*

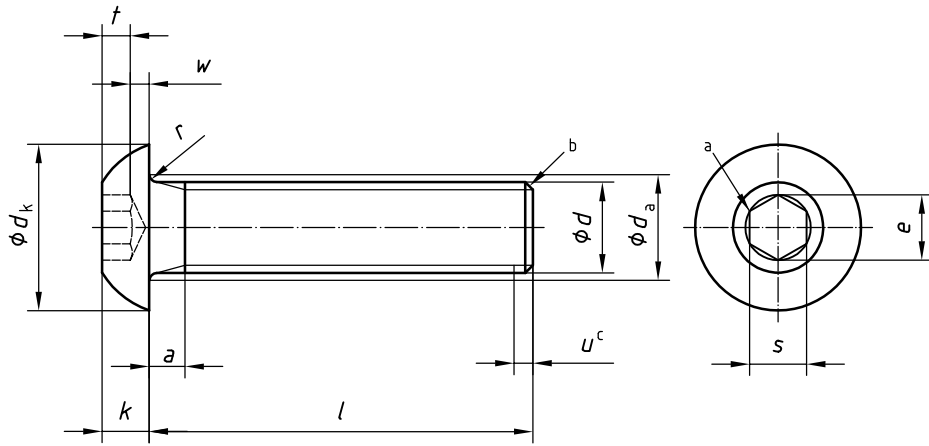
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

ISO 23429, *Gauging of hexagon sockets*

3 Dimensions

See Figure 1 and Table 1.

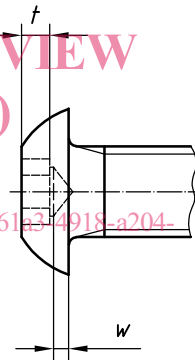
Symbols and designations of dimensions are defined in ISO 225.



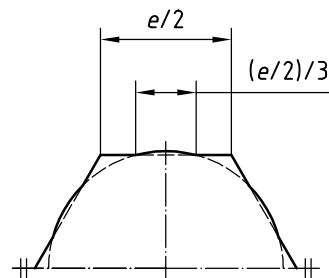
Alternative form of socket permissible

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For broached sockets which are at the maximum limit of size the overcut resulting from drilling shall not exceed 1/3 of the length of any flat of the socket which is $e/2$.



- ^a A slight rounding or countersink at the mouth of the socket is permissible.
- ^b Point chamfered or for sizes M4 and below "as rolled" according to ISO 4753.
- ^c Incomplete thread $u \leq 2P$.

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

Thread (<i>d</i>)		M3	M4	M5	M6	M8	M10	M12	M16	
<i>P</i> ^a		0,5	0,7	0,8	1	1,25	1,5	1,75	2	
<i>a</i>	max.	1,0	1,4	1,6	2	2,50	3,0	3,50	4	
	min.	0,5	0,7	0,8	1	1,25	1,5	1,75	2	
<i>d_a</i>	max.	3,6	4,7	5,7	6,8	9,2	11,2	14,2	18,2	
<i>d_k</i>	max.	5,7	7,60	9,50	10,50	14,00	17,50	21,00	28,00	
	min.	5,4	7,24	9,14	10,07	13,57	17,07	20,48	27,48	
<i>e^{b, c}</i>	min.	2,303	2,873	3,443	4,583	5,723	6,863	9,149	11,429	
<i>k</i>	max.	1,65	2,20	2,75	3,3	4,4	5,5	6,60	8,80	
	min.	1,40	1,95	2,50	3,0	4,1	5,2	6,24	8,44	
<i>r</i>	min.	0,1	0,2	0,2	0,25	0,4	0,4	0,6	0,6	
<i>s^c</i>	nom.	2	2,5	3	4	5	6	8	10	
	max.	2,080	2,58	3,080	4,095	5,140	6,140	8,175	10,175	
	min.	2,020	2,52	3,020	4,020	5,020	6,020	8,025	10,025	
<i>t</i>	min.	1,04	1,3	1,56	2,08	2,6	3,12	4,16	5,2	
<i>w</i>	min.	0,2	0,3	0,38	0,74	1,05	1,45	1,63	2,25	
<i>l^d</i>		<p style="text-align: center;">STANDARD PREVIEW (standards.itech.ai)</p> <p style="text-align: center;">ISO 7380:2004 https://standards.itech.ai/catalog/standards/sist/1907de39-61a3-3-4918-a204-1353d1a19de3/iso-7380-2004</p> <p style="text-align: center;">Range of commercial lengths</p>								
nom.	min.									max.
6	5,76									6,24
8	7,71									8,29
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
30	29,58									30,42
35	34,5									35,5
40	39,5									40,5
45	44,5									45,5
50	49,5									50,5

^a *P* is the pitch of the thread.

^b $e_{\min} = 1,14s_{\min}$.

^c Combined gauging of socket dimensions *e* and *s*, see ISO 23429.

^d For nominal lengths below the bottom stepped line, the thread lengths, at the discretion of the manufacturer, may be between a minimum of $2d + 12$ mm and a maximum which is within $2P$ off the head. Intermediate nominal lengths according to ISO 888 are permissible.

4 Requirements and reference International Standards

See Tables 2 and 3.

Table 2 — Requirements and reference International Standards

Material		Steel
General requirements	International Standard	ISO 8992
Thread	Tolerance	6g for property classes 8.8 and 10.9; 5g6g for property class 12.9
	International Standards	ISO 261, ISO 965-2, ISO 965-3
Mechanical properties	Property class ^a	8.8, 10.9, 12.9
	International Standard	ISO 898-1
Tolerances	Product grade	A
	International Standard	ISO 4759-1
Finish		As processed Requirements for electroplating are covered in ISO 4042. Requirements for non-electrolytically applied zinc flake coatings are covered in ISO 10683.
Surface discontinuities		Limits for surface discontinuities are given in ISO 6157-1 and in ISO 6157-3 for property class 12.9.
Acceptability		Acceptance procedure is covered in ISO 3269.
<p>^a Because of their head configurations, these screws may not meet the minimum ultimate tensile loads specified in ISO 898-1, when tested in accordance with test programme B. They shall nevertheless meet the other material and property requirements for the respective property class specified in ISO 898-1.</p> <p>In addition, when full-size screws are loaded using the type of testing fixture illustrated in ISO 898-1, they shall withstand, without fracture, the minimum ultimate tensile loads given in Table 3.</p> <p>If tested to failure, the fracture may occur in the threaded section, the head, the shank or at the head/shank junction.</p>		

Table 3 — Minimum ultimate tensile loads for hexagon socket button head screws
(80 % of the values specified in ISO 898-1)

Thread (d)	Property class		
	8.8	10.9	12.9
	Minimum ultimate tensile load		
	N		
M3	3 220	4 180	4 190
M4	5 620	7 300	8 560
M5	9 080	11 800	13 800
M6	12 900	16 700	19 600
M8	23 400	30 500	35 700
M10	37 100	48 200	56 600
M12	53 900	70 200	82 400
M16	100 000	130 000	154 000

5 Designation

EXAMPLE A hexagon socket button head screw with thread M12 and nominal length $l = 40$ mm and property class 12.9, is designated as follows:

Hexagon socket button head screw ISO 7380 - M12×40 - 12.9

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