
Hexagon socket button head screws

Vis à métaux, à tête cylindrique bombée plate à six pans creux

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[ISO 7380:1997](https://standards.iteh.ai/catalog/standards/sist/38a46ca1-a020-4be1-85a9-e65855b06beb/iso-7380-1997)

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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.

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.

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

This second edition cancels and replaces the first edition (ISO 7380:1983), which has been technically revised.

Annex A forms an integral part of this International Standard.

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International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
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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 of product grade A and property class 12.9.

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

Gauging of hexagon sockets is specified in annex A.

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

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 225:1983, *Fasteners – Bolts, screws, studs and nuts – Symbols and designations of dimensions.*

ISO 261:–¹⁾, *ISO general-purpose metric screw threads – General plan.*

ISO 888:1976, *Bolts, screws and studs – Nominal lengths, and thread lengths for general purpose bolts.*

ISO 898-1:–²⁾, *Mechanical properties of fasteners made of carbon and alloy steel – Part 1: Bolts, screws and studs.*

ISO 965-2:–³⁾, *ISO general-purpose metric screw threads – Tolerances – Part 2: Limits of sizes for general purpose bolt and nut threads – Medium quality.*

ISO 965-3:–⁴⁾, *ISO general-purpose metric screw threads – Tolerances – Part 3: Deviations for contructional threads.*

ISO 3269:1988, *Fasteners – Acceptance inspection.*

ISO 4042:–⁵⁾, *Fasteners – Electroplated coatings.*

ISO 4759-1:–⁶⁾, *Tolerances for fasteners – Part 1: Bolts, screws, studs and nuts – Product grades A, B and C.*

1) To be published. (Revision of ISO 261:1973)

2) To be published. (Revision of ISO 898-1:1988)

3) To be published. (Revision of ISO 965-2:1980)

4) To be published. (Revision of ISO 965-3:1980)

5) To be published. (Revision of ISO 4042:1989)

6) To be published. (Revision of ISO 4759-1:1978)

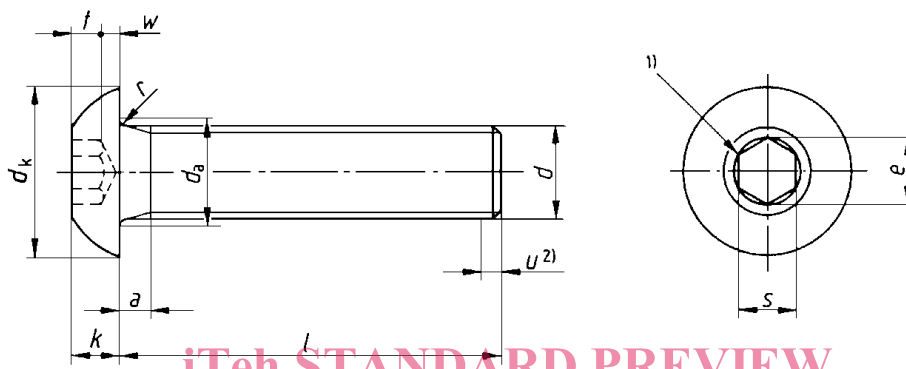
ISO 6157-3:1988, *Fasteners – Surface discontinuities – Part 3: Bolts, screws and studs for special requirements.*

ISO 8992:1986, *Fasteners – General requirements for bolts, screws, studs and nuts.*

3 Dimensions

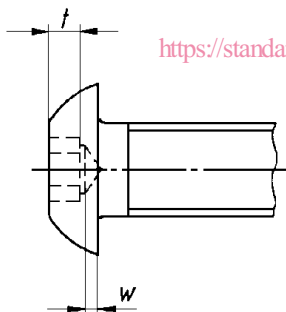
See figure 1 and table 1.

Symbols and designations of symbols are defined in ISO 225.



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Alternative form of socket permissible



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NOTE — For broached sockets which are at the maximum limit of size the overcut resulting from drilling shall not exceed 20 % of the length of any flat of the socket.

1) A slight rounding or countersink at the mouth of the socket is permissible.

2) 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
$P^{1)}$		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
d_a	max.	3,6	4,7	5,7	6,8	9,2	11,2	14,2	18,2
d_k	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
$e^{2)}$	min.	2,3	2,87	3,44	4,58	5,72	6,86	9,15	11,43
<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
$s^{3)}$	nom.	2	2,5	3	4	5	6	8	10
	max.	2,045	2,56	3,071	4,084	5,084	6,095	8,115	10,115
	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
$l^{4)}$		<p>ISO 7380:1997</p> <p>http://standards.iteh.ai/catalog/standards/sist/38a46ca1-a020-4be1-85a9-e65855b06beb/iso-7380-1997</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			Range				
20	19,58	20,42				of			
25	24,58	25,42					commercial		
30	29,58	30,42						lengths	
35	34,5	35,5							
40	39,5	40,5							
45	44,5	45,5							
50	49,5	50,5							
<p>1) P is the pitch of the thread.</p> <p>2) $e_{\min} = 1,14 s_{\min}$.</p> <p>3) s shall be gauged by attribute methods, see annex A for gauges.</p> <p>4) 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 $2P$ of the head. Intermediate nominal lengths according to ISO 888 are permissible.</p>									

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	5g6g
	International Standards	ISO 261, ISO 965-2, ISO 965-3
Mechanical properties	Property class ¹⁾	12.9
	International Standard	ISO 898-1
Tolerances	Product grade	A
	International Standard	ISO 4759-1
Finish		Black oxide (thermal or chemical) Requirements for electroplating are given in ISO 4042 If different electroplating requirements are desired or if requirements are needed for other finishes, they should be negotiated between customer and supplier. Limits for surface discontinuities are given in ISO 6157-3.
Acceptability		Acceptance procedure is dealt with ISO 3269.
<p>1) Because of their head configurations, these screws may not meet the minimum ultimate tensile load for property class 12.9, specified in ISO 898-1, when tested in accordance with test programme B. They shall nevertheless meet the other material and property requirements for property class 12.9 specified in ISO 898-1. 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. 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 of property class 12.9
(80 % of the values specified in ISO 898-1)

Thread	M 3	M 4	M 5	M 6	M 8	M 10	M 12	M 16
Minimum ultimate tensile load, N	4 910	8 560	13 800	19 600	35 700	56 600	82 400	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:

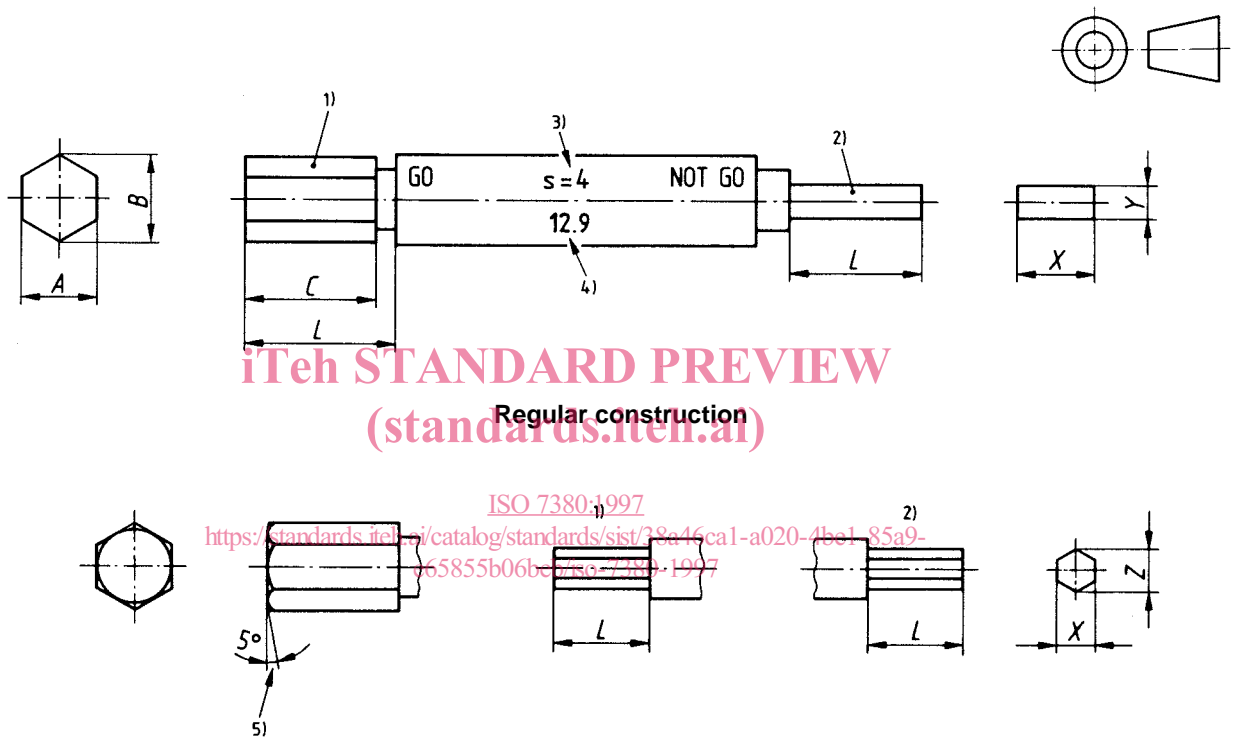
Hexagon socket button head screw ISO 7380 – M12 × 40 – 12.9

Annex A
(normative)

Gauging of hexagon socket

A.1 Gauge dimensions

See figure A.1 and table A.1.



Optional constructions for GO members and NOT GO members for small sizes

- 1) GO member.
- 2) NOT GO member.
- 3) Socket size (width across flats).
- 4) Property classes, for which the gauge applies.
- 5) 5° chamfer optional.

Figure A.1

Table A.1 — Gauge dimensions for hexagon sockets

Dimensions in millimetres

Nominal socket size, <i>s</i>		2	2,5	3	4	5	6	8	10
GO gauge: Width across flats	<i>A</i> max.	2,023	2,525	3,025	4,025	5,025	6,025	8,030	10,030
	min.	2,020	2,520	3,020	4,020	5,020	6,020	8,025	10,025
GO gauge: Width across corners	<i>B</i> max.	2,300	2,870	3,440	4,580	5,720	6,860	9,150	11,430
	min.	2,295	2,865	3,435	4,575	5,715	6,855	9,145	11,425
GO gauge: Length	<i>C</i> min.	5	7	7	7	7	8	8	12
Usable gauge length	<i>L</i> min.	5	7	7	7	7	12	16	20
NOT GO gauge: Width across flats	<i>X</i> max.	2,045	2,560	3,071	4,084	5,084	6,095	8,115	10,115
	min.	2,043	2,555	3,066	4,079	5,079	6,090	8,110	10,110
NOT GO gauge: Thickness	<i>Y</i> max.	–	–	–	1,80	2,30	2,80	3,80	4,80
	min.	–	–	–	1,75	2,25	2,75	3,75	4,75
NOT GO gauge: Width across corners	<i>Z</i> max.	2,23	2,79	3,35	–	–	2	2	6
	min.	2,21	2,77	3,33	–	–	–	–	–

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