Hexagon socket head cap screws — Product grade A

Vis à tête cylindrique à six pans creux — Classe de produit A

First edition — 1977-06-15

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4762 was developed by Technical Committee ISO/TC 2, *Fasteners,* and was circulated to the member bodies in April 1976.

It has been approved by the member bodies of the following countries :

Austria	Hungary	Poland
Belgium	India	Romania
Brazil	Ireland	South Africa, Rep. of
Bulgaria	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Korea, Rep. of	Turkey
Finland	Mexico	United Kingdom
France	Netherlands	U.S.S.R.
Germany	Norway	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Australia
U.S.A.

Hexagon socket head cap screws — Product grade A

INTERNATIONAL STANDARD ISO 4762-1977 (E)/ERRATUM

Published 1978-05-15

ERRATUM

Foreword :

The following sentence is to be added at the end of the Foreword :

This International Standard cancels and replaces ISO Recommendation R 861-1968.

to d_w but in every case must be deburred.

f max. = 1,7 r max.

$$r \text{ max.} = \frac{d_a - d_s}{2}$$

r min. see table

Top of head may be radiused
or chamfered as shown at the
option of the manufacturer.

45° max.

Maximum underhead fillet

Dimensions in millimetres
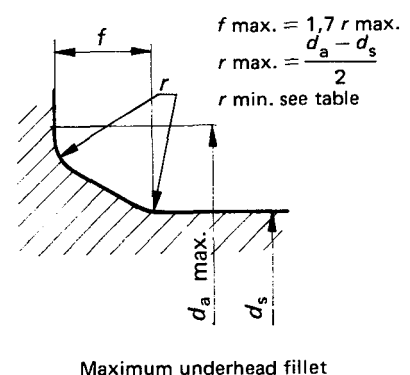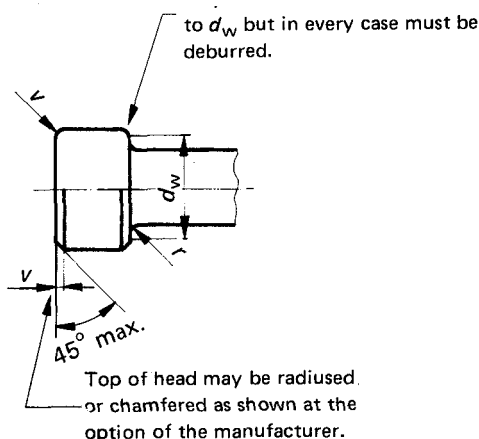
Thread size d		M 1,6	M 2	M 2,5	M 3	M 4	M 5	M 6	M 8
P	[1]	0,35	0,4	0,45	0,5	0,7	0,8	1	1,25
b	ref.	15	16	17	18	20	22	24	28
d_k	max. [2]	3	3,8	4,5	5,5	7	8,5	10	13
	max. [3]	3,14	3,98	4,68	5,68	7,22	8,72	10,22	13,27
	min.	2,86	3,62	4,32	5,32	6,78	8,28	9,78	12,73
d_a	max.	2	2,6	3,1	3,6	4,7	5,7	6,8	9,2
d_s	max.	1,6	2	2,5	3	4	5	6	8
	min.	1,46	1,86	2,36	2,86	3,82	4,82	5,82	7,78
e	min. [4]	1,73	1,73	2,30	2,87	3,44	4,58	5,72	6,86
f	max.	0,34	0,51	0,51	0,51	0,60	0,60	0,68	1,02
k	max.	1,6	2	2,5	3	4	5	6	8
	min.	1,46	1,86	2,36	2,86	3,82	4,82	5,70	7,64
r	min.	0,1	0,1	0,1	0,1	0,2	0,2	0,25	0,4
s	nominal	1,5	1,5	2	2,5	3	4	5	6
	min.	1,52	1,52	2,02	2,52	3,02	4,02	5,02	6,02
	max.	1,56	1,56	2,06	2,58	3,071	4,084	5,084	6,14
t	min.	0,7	1	1,1	1,3	2	2,5	3	4
v	max.	0,16	0,2	0,25	0,3	0,4	0,5	0,6	0,8
d_w	min.	2,72	3,40	4,18	5,07	6,53	8,03	9,38	12,33
w	min.	0,55	0,55	0,85	1,15	1,4	1,9	2,3	3,3

shank length l_s and grip length l_g

l nominal	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.	l_s min.	l_g max.	l_s min.	l_g max.
2,5	2,30	2,70																
3	2,80	3,20																
4	3,76	4,24																
5	4,76	5,24																
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			2	4												
25	24,58	25,42					5,75	8	4,5	7								
30	29,58	30,42							9,5	12	6,5	10	4	8				
35	34,5	35,5									11,5	15	9	13	6	11		
40	39,5	40,5									16,5	20	14	18	11	16	5,75	12
45	44,5	45,5											19	23	16	21	10,75	17
50	49,5	50,5											24	28	21	26	15,75	22
55	54,4	55,6													26	31	20,75	27
60	59,4	60,6													31	36	25,75	32
65	64,4	65,6															30,75	37
70	69,4	70,6															35,75	42
80	79,4	80,6															45,75	52

The popular lengths are between the stepped lines. Lengths above the dotted line are threaded to the head within $3P$. Lengths below the dotted line have values of l_g and l_s according to the following formulae :

$$l_g \text{ max.} = l \text{ nom.} - b \text{ ref.}$$

$$l_s \text{ min.} = l_g \text{ max.} - 5P$$

1) P = pitch of the thread   2) For plain heads   3) For knurled heads   4) e min. = $1,14\ s$ min.

2

Dimensions in millimetres

Thread size d		M 10	M 12	(M 14)	M 16	M 20	M 24	M 30	M 36
P	1)	1,5	1,75	2	2	2,5	3	3,5	4
b	ref.	32	36	40	44	52	60	72	84
d_k	max. 2)	16	18	21	24	30	36	45	54
	max. 3)	16,27	18,27	21,33	24,33	30,33	36,39	45,39	54,46
	min.	15,73	17,73	20,67	23,67	29,67	35,61	44,61	53,54
d_a	max.	11,2	14,2	16,2	18,2	22,4	26,4	33,4	39,4
d_s	max.	10	12	14	16	20	24	30	36
	min.	9,78	11,73	13,73	15,73	19,67	23,67	29,67	35,61
e	min. 4)	9,15	11,43	13,72	16,00	19,44	21,73	25,15	30,85
f	max.	1,02	1,87	1,87	1,87	2,04	2,04	2,89	2,89
k	max.	10	12	14	16	20	24	30	36
	min.	9,64	11,57	13,57	15,57	19,48	23,48	29,48	35,38
r	min.	0,4	0,6	0,6	0,6	0,8	0,8	1	1
s	nominal	8	10	12	14	17	19	22	27
	min.	8,025	10,025	12,032	14,032	17,05	19,065	22,065	27,065
	max.	8,175	10,127	12,146	14,159	17,216	19,275	22,275	27,275
t	min.	5	6	7	8	10	12	15,5	19
v	max.	1	1,2	1,4	1,6	2	2,4	3	3,6
d_w	min.	15,33	17,23	20,17	23,17	28,87	34,81	43,61	52,54
w	min.	4	4,8	5,8	6,8	8,6	10,4	13,1	15,3

shank length l_s and grip length l_g

l nominal	min.	max.	M 10 l_s min.	M 10 l_g max.	M 12 l_s min.	M 12 l_g max.	(M 14) l_s min.	(M 14) l_g max.	M 16 l_s min.	M 16 l_g max.	M 20 l_s min.	M 20 l_g max.	M 24 l_s min.	M 24 l_g max.	M 30 l_s min.	M 30 l_g max.	M 36 l_s min.	M 36 l_g max.
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	5,5	13														
50	49,5	50,5	10,5	18	5,25	14												
55	54,4	55,6	15,5	23	10,25	19												
60	59,4	60,6	20,5	28	15,25	24	10	20	6	16								
65	64,4	65,6	25,5	33	20,25	29	15	25	11	21								
70	69,4	70,6	30,5	38	25,25	34	20	30	16	26	5,5	18						
80	79,4	80,6	40,5	48	35,25	44	30	40	26	36	15,5	28						
90	89,3	90,7	50,5	58	45,25	54	40	50	36	46	25,5	38	15	30				
100	99,3	100,7	60,5	68	55,25	64	50	60	46	56	35,5	48	25	40	10,5	28		
110	109,3	110,7			65,25	74	60	70	56	66	45,5	58	35	50	20,5	38		
120	119,3	120,7			75,25	84	70	80	66	76	55,5	68	45	60	30,5	48	26	46
130	129,2	130,8					80	90	76	86	65,5	78	55	70	40,5	58	36	56
140	139,2	140,8					90	100	86	96	75,5	88	65	80	50,5	68	46	66
150	149,2	150,8							96	106	85,5	98	75	90	60,5	78	56	76
160	159,2	160,8							106	116	95,5	108	85	100	70,5	88	66	86
180	179,2	180,8									115,5	128	105	120	90,5	108	86	106
200	199,075	200,925									135,5	148	125	140	110,5	128	106	126

See notes on page 2.

3 SPECIFICATIONS AND REFERENCE STANDARDS

Material		Steel[1]	Stainless steel	Non-ferrous metal
Thread	Tolerances	5g6g for class 12.9; for other classes 6g		
	International Standards	ISO 261, ISO 965		
Mechanical properties	Class	8.8, 12.9	≤ M20 A2-70 > M20 A2-80	. . .
	International Standards	ISO 898/I[2]	ISO . . .[3]	ISO . . .[3]
Tolerances	Product grade	A		
	International Standard	ISO 4759/I[4]		
Finish		black oxide (thermal or chemical)	plain	plain
		Requirements for electroplating are covered in ISO 4042[4] If different electroplating requirements are desired or if requirements are needed for other finishes, they should be negotiated between customer and supplier.		
Acceptability		For acceptance procedure see ISO . . .[3].		

1) Alloy steel is mandatory as the material for screws of property class 12.9.

2) For screws unsuitable for tensile testing, the hardness requirement shall be maintained throughout the section of the screw.

3) In preparation.

4) At present at the stage of draft.

4 DESIGNATION

Example for the designation of a hexagon socket head cap screw with thread size d = M5, nominal length l = 20 mm and property class 12.9 :

Hexagon socket head cap screw ISO 4762 M5 × 20-12.9