BS EN ISO 14579:2011

BSI Standards Publication

Hexalobular socket head cap screws (ISO 14579:2011)

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National foreword

This British Standard is the UK implementation of EN ISO 14579:2011. It supersedes BS EN ISO 14579:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee FME/9/3, Fasteners - Product Standards.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD

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EN ISO 14579

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Supersedes EN ISO 14579:2001

English Version

Hexalobular socket head cap screws (ISO 14579:2011)

Vis à métaux à tête cylindrique à six lobes internes (ISO 14579:2011)

Zylinderschrauben mit Innensechsrund (ISO 14579:2011)

This European Standard was approved by CEN on 31 January 2011.

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Foreword

This document (EN ISO 14579:2011) has been prepared by Technical Committee ISO/TC 2 "Fasteners" in collaboration with Technical Committee CEN/TC 185 “Fasteners” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

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Foreword

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ISO 14579 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 14579:2001), of which it constitutes a minor revision.

INTERNATIONAL STANDARD **ISO 14579:2011(E)**

Hexalobular socket head cap screws

1 Scope

This International Standard specifies the characteristics of hexalobular socket head cap screws, with thread sizes from M2 up to and including M20, of product grade A.

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, ISO 965-3, ISO 3506-1 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 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 965-3, *ISO general purpose metric screw threads — Tolerances — Part 3: Deviations for constructional screw threads*

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 6157-1, *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 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals*

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

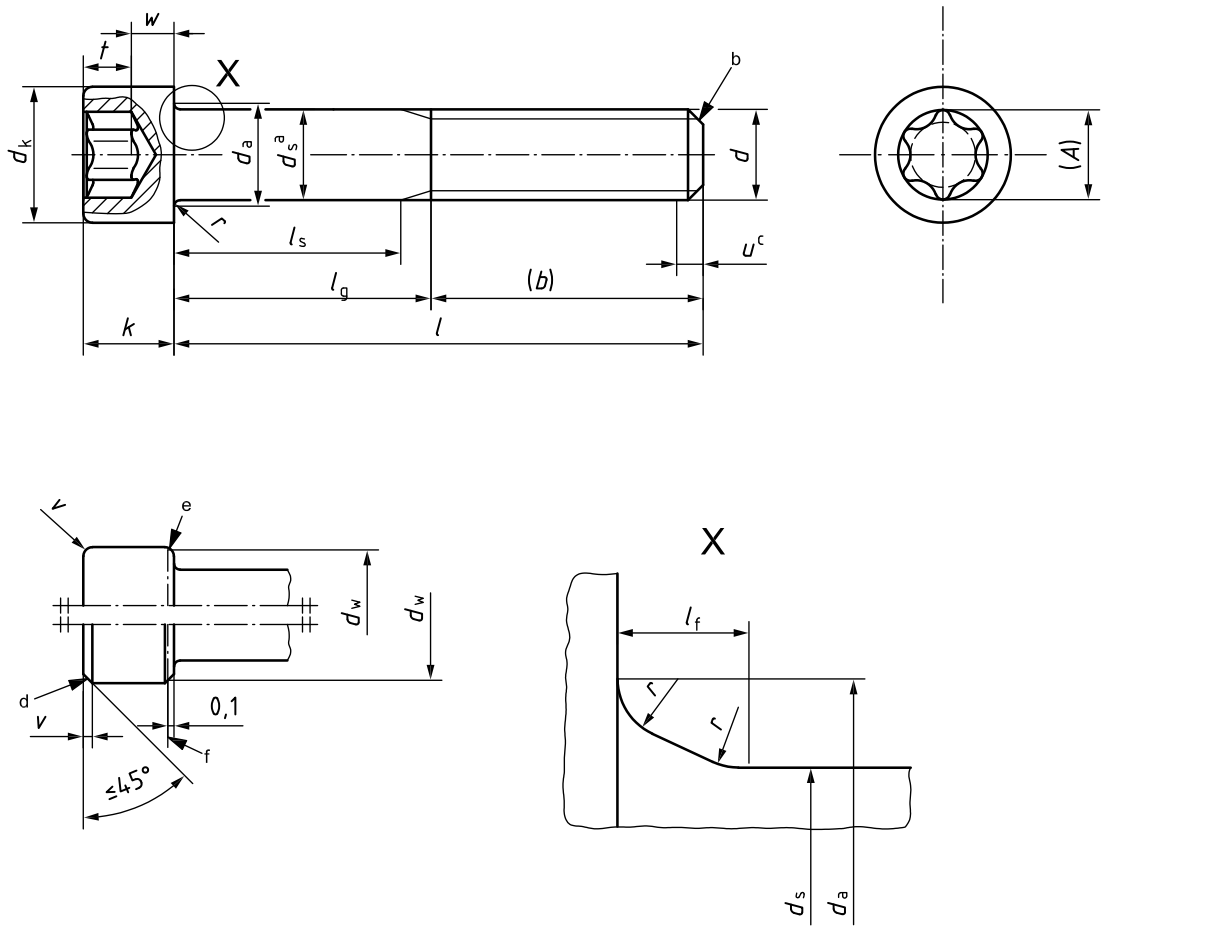
ISO 10664, *Hexalobular internal driving feature for bolts and screws*

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

3 Dimensions

See Figure 1 and Table 1. Symbols and descriptions of dimensions are specified in ISO 225.

Dimensions in millimetres



Maximum underhead fillet, $l_{f,max}$ = 1,7 r_{max}

$$r_{max} = \frac{d_{a,max} - d_{s,max}}{2}$$

For r_{min}, see Table 1.

a d_s applies if values of $l_{s,min}$ are specified.
b The point shall be chamfered or, for threads ⩽ M4, may be as-rolled, in accordance with ISO 4753.
c Incomplete thread $u \leqslant 2P$.
d Top edge of head may be rounded or chamfered, as shown, at the discretion of the manufacturer.
e Bottom edge of head may be rounded or chamfered to d_w but, in every case, shall be free of burrs.
f Reference datum for d_w.

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

Thread, d		**M2**	**M2,5**	**M3**	**M4**	**M5**	**M6**	**M8**
P[a]		0,4	0,45	0,5	0,7	0,8	1	1,25
b[b]	ref.	16	17	18	20	22	24	28
d_k	max.[c]	3,80	4,50	5,50	7,00	8,50	10,00	13,00
	max.[d]	3,98	4,68	5,68	7,22	8,72	10,22	13,27
	min.	3,62	4,32	5,32	6,78	8,28	9,78	12,73
d_a	max.	2,6	3,1	3,6	4,7	5,7	6,8	9,2
d_s	max.	2,00	2,50	3,00	4,00	5,00	6,00	8,00
	min.	1,86	2,36	2,86	3,82	4,82	5,82	7,78
l_f	max.	0,51	0,51	0,51	0,6	0,6	0,68	1,02
k	max.	2,00	2,50	3,00	4,00	5,00	6,0	8,00
	min.	1,86	2,36	2,86	3,82	4,82	5,7	7,64
r	min.	0,1	0,1	0,1	0,2	0,2	0,25	0,4
v	max.	0,2	0,25	0,3	0,4	0,5	0,6	0,8
d_w	min.	3,48	4,18	5,07	6,53	8,03	9,38	12,33
w	min.	0,55	0,85	1,15	1,4	1,9	2,3	3,3
Hexalobular socket	Socket no.	**6**	**8**	**10**	**20**	**25**	**30**	**45**
	A ref.	1,75	2,4	2,8	3,95	4,5	5,6	7,95
	t max.	0,84	1,04	1,27	1,80	2,03	2,42	3,31
	t min.	0,71	0,91	1,01	1,42	1,65	2,02	2,92

l[e]			l_s and l_g													
			l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g	l_s	l_g
nom.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
3	2,8	3,2														
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

Table 1 (*continued*)

Dimensions in millimetres

Thread, d		**M10**	**M12**	**(M14)**[f]	**M16**	**(M18)**[f]	**M20**
P[a]		1,5	1,75	2	2	2,5	2,5
b[b]	ref.	32	36	40	44	48	52
d_k	max.[c]	16,00	18,00	21,00	24,00	27,00	30,00
	max.[d]	16,27	18,27	21,33	24,33	27,33	30,33
	min.	15,73	17,73	20,67	23,67	26,67	29,67
d_a	max.	11,2	13,7	15,7	17,7	20,2	22,4
d_s	max.	10,00	12,00	14,00	16,00	18,00	20,00
	min.	9,78	11,73	13,73	15,73	17,73	19,67
l_f	max.	1,02	1,45	1,45	1,45	1,87	2,04
k	max.	10,00	12,00	14,00	16,00	18,00	20,00
	min.	9,64	11,57	13,57	15,57	17,57	19,48
r	min.	0,4	0,6	0,6	0,6	0,6	0,8
v	max.	1	1,2	1,4	1,6	1,8	2
d_w	min.	15,33	17,23	20,17	23,17	25,87	28,87
w	min.	4	4,8	5,8	6,8	7,8	8,6
Hexalobular socket[e]	Socket no.	**50**	**55**	**60**	**70**	**80**	**90**
A	ref.	8,95	11,35	13,45	15,7	17,75	20,2
t	max.	4,02	5,21	5,99	7,01	8,00	9,20
	min.	3,62	4,82	5,62	6,62	7,50	8,69

l_g			l_s and l_g											
nom.	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.
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										
55	54,4	55,6	15,5	23	10,25	29								
60	59,4	60,6	20,5	28	15,25	24	10	20						
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	9,5	22		
80	79,4	80,6	40,5	48	35,25	44	30	40	26	36	19,5	32	15,5	28
90	89,3	90,7	50,5	58	45,25	54	40	50	36	46	29,5	42	25,5	38
100	99,3	100,7	60,5	68	55,25	64	50	60	46	56	39,5	52	35,5	48
110	109,3	110,7			65,25	74	60	70	56	66	49,5	62	45,5	58
120	119,3	120,7			75,25	84	70	80	66	76	59,5	72	55,5	68
130	129,2	130,8					80	90	76	86	69,5	82	65,5	78
140	139,2	140,8					90	100	86	96	79,5	92	75,5	88
150	149,2	150,8							96	106	89,5	102	85,5	98
160	159,2	160,8							106	116	99,5	112	95,5	108
180	179,2	180,8									119,5	132	115,5	128
200	199,075	200,925											135,5	148

[a] P is the pitch of the thread.

[b] For lengths below the discontinuous, stepped line.

[c] For plain heads.

[d] For knurled heads.

[e] For the acceptance of the hexalobular socket and for gauges, see ISO 10664.

[f] Sizes in parentheses should be avoided, if possible.

[g] The range of preferred lengths is between the solid, bold, stepped lines. Lengths above the dashed, stepped line are threaded to the head within $3P$. Lengths below the discontinuous, stepped line have values of l_g and l_s in accordance with the following equation: $l_{g,max} = l_{nom} - b$; $l_{s,min} = l_{g,max} - 5P$.

4 Specifications and reference International Standards

See Table 2.

Table 2 — Specifications and reference International Standards

Material		Steel	Stainless steel	Non-ferrous metal
General requirements	International Standard	ISO 8992		
Thread	Tolerance class	5g6g for property class 12.9/12.9; for other property classes: 6g		
	International Standard	ISO 261, ISO 965-2, ISO 965-3		
Mechanical property	Property class	<M3: as agreed ≥M3: 8.8, 9.8, 10.9, 12.9/12.9	A2-70, A4-70[b] A3-70, A5-70	As agreed
	International Standard	ISO 898-1[a]	ISO 3506-1	ISO 8839
Tolerance	Product grade	A		
	International Standard	ISO 4759-1		
Hexalobular socket	International Standard	ISO 10664		
Finish — Coating		As processed Requirements for electroplating are specified in ISO 4042. Requirements for non-electrolytically applied zinc flake coatings are specified in ISO 10683.	As processed	As processed Requirements for electroplating are specified in ISO 4042.
		Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser.		
Surface integrity		Limits for surface discontinuities are specified in ISO 6157-1 and, for property class 12.9/12.9, in ISO 6157-3.	—	—
Acceptability		Acceptance inspection is specified in ISO 3269.		

[a] For screws unsuitable for tensile testing, the hardness requirements shall be complied with throughout the section of the screw.

[b] For stainless steel screws machined from bar, it is permissible to use grade A1-70 for sizes ⩽M12, and A1-50 for sizes >M12, and to mark them accordingly.

5 Designation

EXAMPLE A hexalobular socket head cap screw with thread M5, nominal length l = 20 mm and property class 8.8 is designated as follows:

Hexalobular socket head cap screw ISO 14579 - M5 × 20 - 8.8

Annex A
(informative)

Masses of carbon steel screws

In Table A.1, approximate masses of carbon steel screws with preferred lengths are given for information only.

Table A.1 — Approximate mass of carbon steel screws

Thread, d	M2	M2,5	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20
Nominal length l	Approximate mass of carbon steel screws, in kilograms per 1 000 pieces (ρ = 7,85 kg/dm^3)												
3	0,155												
4	0,175	0,345											
5	0,195	0,375	0,67										
6	0,215	0,405	0,71	1,50									
8	0,255	0,465	0,80	1,65	2,45								
10	0,295	0,525	0,88	1,80	2,70	4,70							
12	0,355	0,585	0,96	1,95	2,95	5,07	10,9						
16	0,415	0,705	1,16	2,25	3,45	5,75	12,1	20,9					
20	0,495	0,825	1,36	2,65	4,01	6,53	13,4	22,9	32,1				
25		0,975	1,61	3,15	4,78	7,59	15,0	25,4	35,7	48,0	71,3		
30			1,86	3,65	5,55	8,30	16,9	27,9	39,3	53,0	77,8	111	128
35				4,15	6,32	9,91	18,9	30,4	42,9	58,0	84,4	120	139
40				4,65	7,09	11,0	20,9	32,9	46,5	63,0	91,0	129	150
45					7,86	12,1	22,9	36,1	50,1	68,0	97,6	128	161
50					8,63	13,2	24,9	30,3	54,5	73,0	106	147	172
55						14,3	26,9	42,5	58,9	78,0	114	156	183
60						15,4	28,9	45,7	63,4	84,0	122	165	194
65							31,0	48,9	67,8	90,0	130	174	205
70							33,0	52,1	71,3	96,0	138	183	216
80							37,0	58,5	80,2	108	154	203	241
90								64,9	89,1	120	170	223	266
100								71,2	98,0	132	186	243	291
110									107	144	202	263	316
120									116	156	218	283	341
130										168	234	303	366
140										180	250	323	391
150											266	343	416
160											282	363	441
180												403	491
200													541

Bibliography

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

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