BS EN ISO 14581:2013

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Fasteners — Hexalobular socket countersunk flat head screws

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National foreword

This British Standard is the UK implementation of EN ISO 14581:2013.

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

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

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Fasteners - Hexalobular socket countersunk flat head screws (ISO 14581:2013)

Éléments de fixation - Vis à tête fraisée réduite à six lobes internes (ISO 14581:2013)

Mechanische Verbindungselemente - Senkschrauben mit Innensechsrund (ISO 14581:2013)

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Foreword

This document (EN ISO 14581:2013) 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.

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Foreword

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The committee responsible for this document is ISO/TC 2, *Fasteners*, Subcommittee SC 11, *Fasteners with metric external thread*.

Fasteners — Hexalobular socket countersunk flat head screws

1 Scope

This International Standard specifies the characteristics of hexalobular socket countersunk flat head screws in product grade A and with threads from M2 to M10 inclusive and with reduced loadability according to Table 3.

If, in special cases, specifications other than those listed in this International Standard are required, they can be selected from existing International Standards, e.g. ISO 261, ISO 888, ISO 898-1, ISO 965-2, ISO 3506-1 and ISO 4759-1.

NOTE Countersunk head screws, high head, made of steel, with property classes 4.8, 8.8 and 10.9, are specified in ISO 14582, but these products are not interchangeable, because of different head heights.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 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 7721, *Countersunk head screws — Head configuration and gauging*

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

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

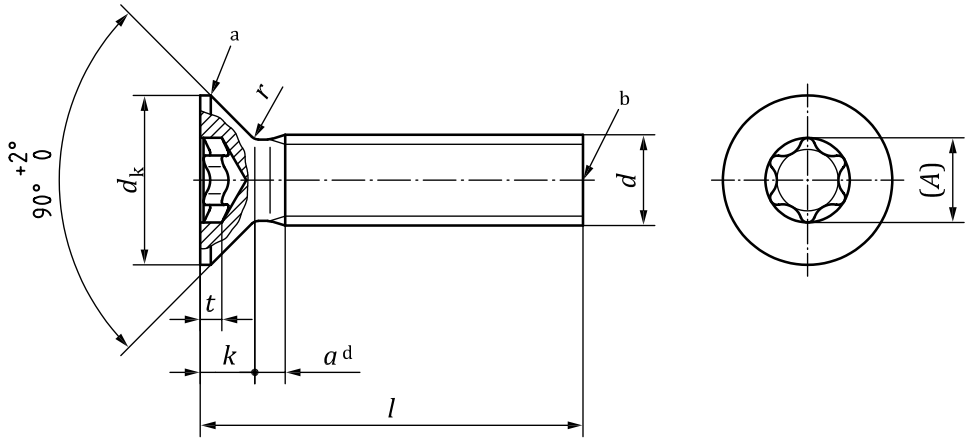
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

ISO 10684, *Fasteners — Hot dip galvanized coatings*

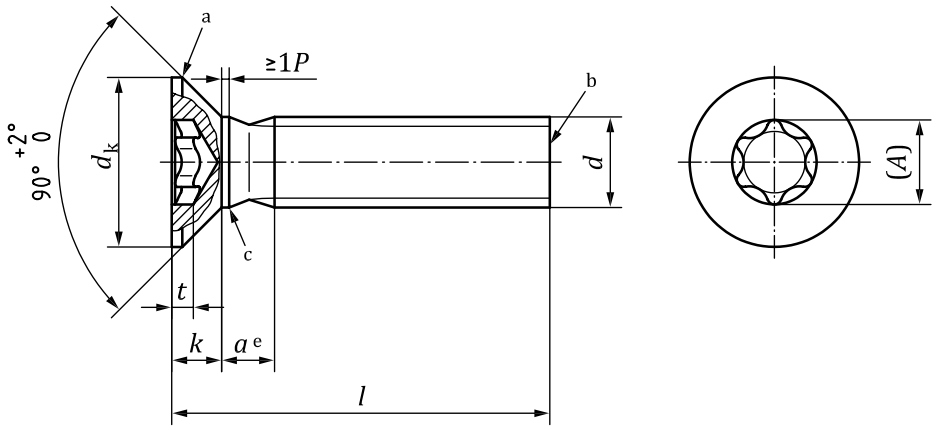
ISO 16048, *Passivation of corrosion-resistant stainless-steel fasteners*

3 Dimensions

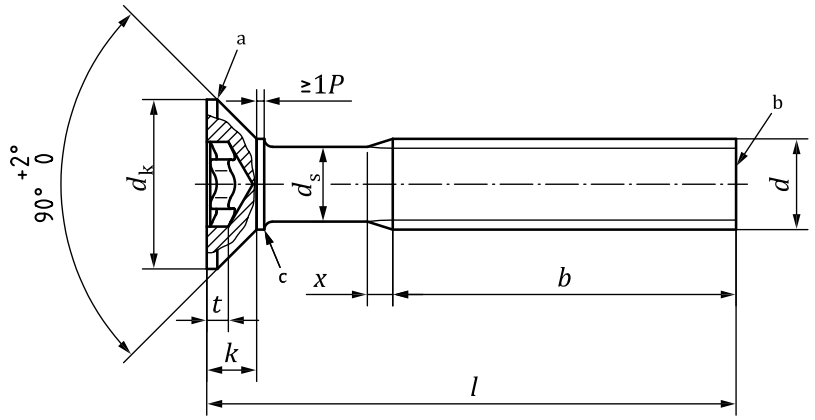
See Figure 1 and Table 1. Symbols and descriptions of dimensions are specified in ISO 225.



a) Screws without shoulder for sizes M2 to M4



b) Fully threaded screws with shoulder for sizes M5 to M10



c) Partially threaded screws with shoulder for sizes M5 to M10

Key

NOTE Shank diameter, d_s, is approximately equal to the pitch diameter or equal to the permissible major thread diameter.

a Edge of the head flat or rounded.

b As rolled end.

c Any shape or size of the reinforcing feature is at the discretion of the manufacturer and shall not exceed d.

d $a_{max} \leq 2P$.

e $a_{max} \leq 2{,}5P$.

Figure 1 — Hexalobular socket countersunk flat head screw

Table 1 — Dimensions for hexalobular socket countersunk flat head screws

Dimensions in millimetres

Thread, *d*				**M2**	**M2,5**	**M3**	**(M3,5)** a	**M4**	**M5**	**M6**	**M8**	**M10**
				without shoulder					with shoulder			
P[b]				0,4	0,45	0,5	0,6	0,7	0,8	1	1,25	1,5
b			min.	25	25	25	38	38	38	38	38	38
d_k[c]	theoretical		max.	4,4	5,5	6,3	8,2	9,4	10,4	12,6	17,3	20
	actual	nom. =	max.	3,80	4,70	5,50	7,30	8,40	9,30	11,30	15,80	18,30
			min.	3,50	4,40	5,20	6,94	8,04	8,94	10,87	15,37	17,78
k[c]		nom. =	max.	1,20	1,50	1,65	2,35	2,70	2,70	3,30	4,65	5,00
r			max.	0,5	0,6	0,8	0,9	1,0	1,3	1,5	2,0	2,5
x			max.	1,00	1,10	1,25	1,50	1,75	2,00	2,50	3,20	3,80
Hexalobular socket[d]		Socket No.		**6**	**8**	**10**	**15**	**20**	**25**	**30**	**45**	**50**
		A	ref.	1,75	2,40	2,80	3,35	3,95	4,50	5,60	7,95	8,95
		t	max.	0,64	0,79	0,83	1,32	1,53	1,51	1,78	2,54	2,80
			min.	0,51	0,66	0,70	1,16	1,14	1,12	1,39	2,15	2,41
l[e]												
nom.[a]	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										
(14)	13,65	14,35										
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										
(55)	54,05	55,95										
60	59,05	60,95										

NOTE Preferred lengths are between the bold, stepped lines.

a Sizes in brackets should be avoided if possible.

b *P* is the pitch of the thread.

c The gauging of head dimensions is specified in ISO 7721.

d The acceptance procedure for the hexalobular socket and corresponding gauges are specified in ISO 10664.

e Screws with nominal lengths above the discontinuous, stepped line are threaded up to the head [$b = l - (k + a)$].

4 Requirements and reference International Standards

See Table 2 and Table 3.

Table 2 — Requirements and reference International Standards

Material		Steel	Stainless steel
General requirements	International Standard	ISO 8992	
Thread	Tolerance class	6g	
	International Standards	ISO 261, ISO 965-2	
Mechanical properties	Property class/ steel grade	4.8, 8.8[a]	A2-50, A4-50 A2-70, A4-70
	Marking symbol	04.8, 08.8	A2-050, A4-050 A2-070, A4-070[b]
	International Standards	ISO 898-1	ISO 3506-1[c]
Tolerance	Product grade	A	
	International Standard	ISO 4759-1	
Hexalobular socket	International Standard	ISO 10664	
Finish — Coating		As processed Requirements for electro-plating are specified in ISO 4042. Requirements for non-electrolytically applied zinc flake coatings are specified in ISO 10683. Requirements for hot dip galvanizing are specified in ISO 10684.	Clean and bright A method for passivation is specified in ISO 16048.
		Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser.	
Surface integrity		Limits for surface discon-tinuities are specified in ISO 6157-1.	—
Acceptability		The acceptance procedure is specified in ISO 3269.	

[a] Because of their head configurations, these screws might not meet the minimum ultimate tensile loads specified in ISO 898-1. They shall meet the other requirements for the respective property class specified in ISO 898-1.

In addition, when full-size screws are tensile tested in accordance with ISO 898-1, they shall withstand the reduced minimum ultimate tensile loads given in Table 3. When tested to the ultimate tensile load, the fracture might occur in the threaded section, the head, the shank or at the head/shank junction.

[b] The marking symbols for stainless steel fasteners with reduced loadability are intended to be included in the next revision of ISO 3506-1.

[c] Because of their head configurations, these screws might not meet the minimum ultimate tensile loads specified in ISO 3506-1. They shall meet the other requirements for the respective steel grade specified in ISO 3506-1.

In addition, when full-size screws are tensile tested in accordance with ISO 3506-1, they shall withstand the reduced minimum ultimate tensile loads given in Table 3. When tested to failure, the fracture might occur in the threaded section, the head, the shank or at the head/shank junction.

For reduced minimum ultimate tensile load values determined on the basis of $R_{m,min}$ and $A_{s,nom}$ according to property classes 50 and 70 of ISO 3506-1, see Table 3.

Table 3 — Reduced minimum ultimate tensile loads for hexalobular socket countersunk flat head screws

Thread, *d*	Property class			
	4.8[a]	8.8[a]	50[b]	70[b]
	Reduced minimum ultimate tensile load N			
M2	—	—	820	1 160
M2,5	—	—	1 350	1 900
M3	1 690	3 220	2 010	2 810
M3,5	2 280	4 340	2 710	3 790
M4	2 950	5 620	3 510	4 910
M5	4 770	9 080	5 680	7 950
M6	6 750	12 900	8 000	11 200
M8	12 300	23 400	14 600	20 400
M10	19 500	37 100	23 200	32 400

[a] 80 % of the values for $F_{m,min}$ specified in ISO 898-1.

[b] 80 % of the values for $F_{m,min}$ ($R_{m,min} \times A_{s,nom}$). $R_{m,min}$ and $A_{s,nom}$ are specified in ISO 3506-1.

5 Marking

When requested, screws of diameter M5 and above with reduced loadability shall be marked:

— for steel fasteners in accordance with ISO 898-1;

— for stainless steel fasteners in accordance with ISO 3506-1, but with the marking symbols specified in Table 2.

6 Designation

The designation requirements for fasteners with reduced loadability shall apply for all sizes:

— for steel fasteners as specified in ISO 898-1;

— for stainless steel fasteners as specified in this International (product) Standard in addition to ISO 3506-1.

EXAMPLE 1 A hexalobular socket countersunk flat head screw with thread M5, nominal length l = 20 mm and property class 4.8 in accordance with ISO 898-1 is designated as follows:

Hexalobular socket countersunk flat head screw ISO 14581 - M5 × 20 - 04.8

EXAMPLE 2 A hexalobular socket countersunk flat head screw with thread M5, nominal length l = 20 mm, stainless steel grade A2 and property class 50 in accordance with ISO 3506-1 is designated as follows:

Hexalobular socket countersunk flat head screw ISO 14581 - M5 × 20 - A2-050

Bibliography

[1] ISO 888, *Fasteners — Bolts, screws and studs — Nominal lengths and thread lengths*

[2] ISO 14582, *Hexalobular socket countersunk head screws, high head*

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