

BS ISO 10509:2012



BSI Standards Publication

Hexagon flange head tapping screws

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National foreword

This British Standard is the UK implementation of ISO 10509:2012. It supersedes BS 7600:1992 which is withdrawn.

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

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

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INTERNATIONAL STANDARD

ISO 10509

Second edition
2012-05-15

Hexagon flange head tapping screws

Vis à tôle à tête hexagonale à embase cylindro-tronconique



Reference number
ISO 10509:2012(E)



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Foreword

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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 10509 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 13, *Fasteners with non-metric thread*.

This second edition cancels and replaces the first edition (ISO 10509:1992), which has been technically revised. In particular, Clauses 2 and 5, Tables 1 and 2, as well as Figures 1 and A.1 have been technically revised.

Hexagon flange head tapping screws

1 Scope

This International Standard specifies hexagon flange head tapping screws with threads from ST2,2 up to and including ST9,5.

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 1478, *Tapping screws thread*

ISO 2702, *Heat-treated steel tapping screws — Mechanical properties*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 4: Tapping screws*

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

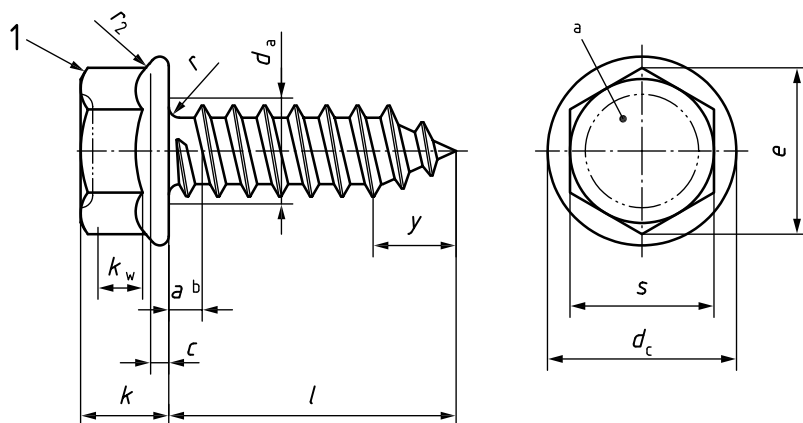
ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

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

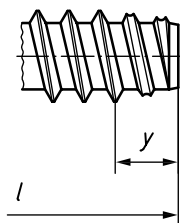
3 Dimensions

For the dimensions, see Figure 1 and Table 1.

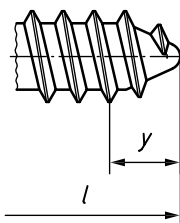
Symbols and descriptions of dimensions are specified in ISO 225.



a) Type C



b) Type F



c) Type R

Key

- 1 chamfer or radius
- a Optional indentation.
- b Dimension *a* is to be measured at the core diameter of the first full thread.

Figure 1 — Hexagon flange head tapping screw

Table 1 — Dimensions

Dimensions in millimetres

Thread		ST2,2	ST2,9	ST3,5	ST4,2	ST4,8	ST5,5	ST6,3	ST8	ST9,5	
p^a		0,8	1,1	1,3	1,4	1,6	1,8	1,8	2,1	2,1	
a	max.	0,8	1,1	1,3	1,4	1,6	1,8	1,8	2,1	2,1	
d_a	max.	2,8	3,5	4,1	4,9	5,6	6,3	7,3	9,2	10,7	
d_c	max.	4,5	6,4	7,5	8,5	10,0	11,2	12,8	16,8	21,0	
	min.	4,1	5,9	6,9	7,8	9,3	10,3	11,8	15,5	19,3	
c	min.	0,3	0,4	0,5	0,6	0,6	0,8	1,0	1,2	1,4	
s	nom. = max.	3,00	4,00	5,00	5,50	7,00	7,00	8,00	10,00	13,00	
	min.	2,86	3,82	4,82	5,32	6,78	6,78	7,78	9,78	12,73	
e	min.	3,16	4,27	5,36	5,92	7,55	7,55	8,66	10,89	14,16	
k	max.	2,2	3,2	3,8	4,3	5,2	6,0	6,7	8,6	10,7	
k_w	min.	0,85	1,25	1,60	1,80	2,20	2,50	2,80	3,70	4,60	
r	min.	0,1	0,1	0,1	0,2	0,2	0,2	0,3	0,4	0,4	
r_2	max.	0,1	0,2	0,2	0,2	0,3	0,3	0,4	0,5	0,6	
y	ref.	Type C	2,0	2,6	3,2	3,7	4,3	5,0	6,0	7,5	8,0
		Type F	1,6	2,1	2,5	2,8	3,2	3,6	3,6	4,2	4,2
		Type R	—	—	2,7	3,2	3,6	4,3	5,0	6,3	—
l^b		Type C and type R		Type F							
		nom.	min.	max.	min.	max.					
4,5	3,7	5,3	3,7	4,5		—	—	—	—	—	
6,5	5,7	7,3	5,7	6,5			—	—	—	—	
9,5	8,7	10,3	8,7	9,5				—	—	—	
13	12,2	13,8	12,2	13,0		Range				—	
16	15,2	16,8	15,2	16,0						—	
19	18,2	19,8	18,2	19,0			of				
22	21,2	22,8	20,7	22,0				preferred			
25	24,2	25,8	23,7	25,0						lengths	
32	30,7	33,3	30,7	32,0							
38	36,7	39,3	36,7	38,0							
45	43,7	46,3	43,5	45,0							
50	48,7	51,3	48,5	50,0							
^a P is the pitch of the thread.											
^b Sizes with lengths marked with a dash (—) shall not be manufactured.											

4 Specifications and reference International Standards

See Table 2.

Table 2 — Specifications and reference International Standards

Material		Steel, in accordance with ISO 2702	Stainless steel
General requirements		ISO 8992	
Thread	International Standard	ISO 1478	
Mechanical property	International Standard	ISO 2702	ISO 3506-4
Tolerances	Product grade	A	
	International Standard	ISO 4759-1	
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. Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser.	A method for passivation is specified in ISO 16048.
Acceptability		Acceptance procedure is specified in ISO 3269.	

5 Designation

EXAMPLE 1 A hexagon flange head tapping screw with thread size ST3,5, of nominal length $l = 16$ mm, made of steel (St) in accordance with ISO 2702 and with a rounded end (type R) is designated as follows:

Tapping screw ISO 10509 - ST3,5 × 16 - St - R

EXAMPLE 2 A hexagon flange head tapping screw with thread size ST3,5, of nominal length $l = 16$ mm, made of stainless steel (A4-20H) in accordance with ISO 3506-4 and with a rounded end (type R) is designated as follows:

Tapping screw ISO 10509 - ST3,5 × 16 - A4-20H - R

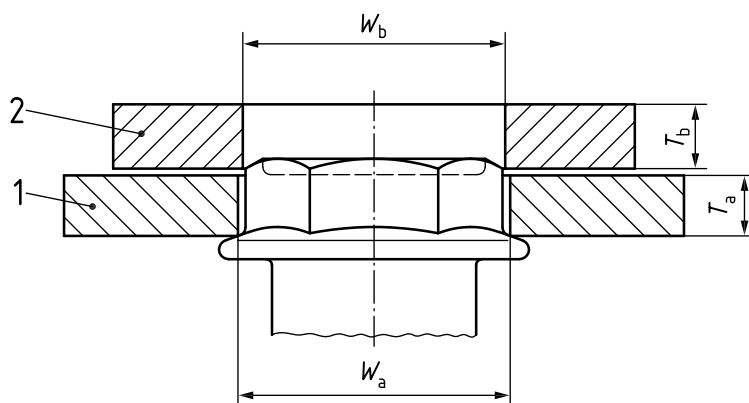
Annex A (normative)

Check on head and flange gauges

The head shall be gauged using two ring gauges, A and B, to demonstrate the coincidental acceptability of hexagon height, wrenching height, corner fill and width across corners; see Figure A.1.

Gauge A shall be placed over the head and shall seat on the flange.

Gauge B shall be placed on the top of the head normal to the bolt axis. The two gauges shall not be in contact.



Key

- 1 gauge A
- 2 gauge B

$W_{a,min}$ is equal to the theoretical maximum width across corners;

$W_{b,max}$ is equal to the minimum width across corners minus 0,01 mm;

$T_{a,max}$ is equal to the minimum wrenching height k_w .

Figure A.1 — Check on head and flange gauges

Table A.1 — Gauge dimensions

Dimensions in millimetres

Thread	Gauge A				Gauge B		
	W_a		T_a		W_b		T_b
	max.	min.	max.	min.	max.	min.	min.
ST2,2	3,48	3,47	0,85	0,84	3,15	3,14	2
ST2,9	4,63	4,62	1,25	1,24	4,26	4,25	2
ST3,5	5,78	5,77	1,60	1,59	5,35	5,34	2
ST4,2	6,36	6,35	1,80	1,79	5,91	5,90	3
ST4,8	8,09	8,08	2,20	2,19	7,54	7,53	3
ST5,5	8,09	8,08	2,50	2,49	7,54	7,53	3
ST6,3	9,25	9,24	2,80	2,79	8,65	8,64	3
ST8	11,56	11,55	3,70	3,69	10,88	10,87	4
ST9,5	15,02	15,01	4,60	4,59	14,15	14,14	4

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