INTERNATIONAL STANDARD

ISO 10509

First edition
1992-04-15

Hexagon flange head tapping screws

Vis à tôle à tête hexagonale à embase cylindro-tronconique

Reference number
ISO 10509:1992(E)

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 10509 was prepared by Technical Committee ISO/TC 2, *Fasteners*.

Annex A forms an integral part of this International Standard.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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 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 1478:1983, *Tapping screws thread.*

ISO 2702:1992, *Heat-treated steel tapping screws — Mechanical properties.*

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

ISO 4042:1989, *Threaded components — Electroplated coatings.*

ISO 4759-1:1978, *Tolerances for fasteners — Part 1: Bolts, screws and nuts with thread diameters between 1,6 (inclusive) and 150 mm (inclusive) and product grades A, B and C.*

3 Dimensions

See figure 1 and table 1.

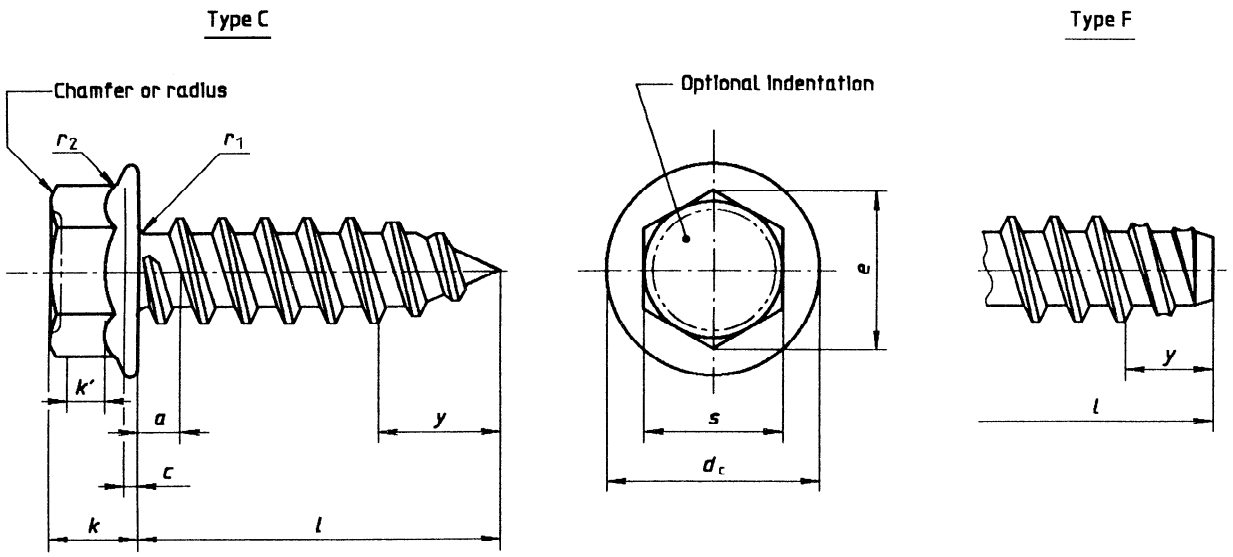


Figure 1

Table 1

Dimensions in millimetres

Thread			ST2,2	ST2,9	ST3,5	ST4,2	ST4,8	ST5,5	ST6,3	ST8	ST9,5
P[1]			0,8	1,1	1,3	1,4	1,6	1,8	1,8	2,1	2,1
a[2]		max.	0,8	1,1	1,3	1,4	1,6	1,8	1,8	2,1	2,1
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	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	6,7	8,6	10,7
k'[3]		min.	0,85	1,25	1,6	1,8	2,2	2,5	2,8	3,7	4,6
r_1		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[4]	ref.	Type C	2	2,6	3,2	3,7	4,3	5	6	7,5	8
		Type F	1,6	2,1	2,5	2,8	3,2	3,6	3,6	4,2	4,2

l[5]											
	Type C		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						**commercial**			
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									

1) P = pitch of the thread

2) a = distance from the underside of the head to the first major diameter of the thread

3) k' = wrenching height

4) y = length of incomplete thread

5) Sizes with lengths marked with a dash (–) in the table shall not be manufactured.

4 Specifications and reference International Standards

See table 2.

Table 2

Material		Steel
Thread	International Standard	ISO 1478
Mechanical properties	International Standard	ISO 2702
Tolerances	Product grade	A
	International Standard	ISO 4759-1
Finish		Plain Requirements for electroplating are covered in ISO 4042.
Acceptability		Acceptance procedure is covered in ISO 3269.

5 Designation

Example for the designation of a hexagon flange head tapping screw, type C, with thread ST3,5 and nominal length $l = 16$ mm:

Tapping screw ISO 10509 - ST3,5 × 16 - C

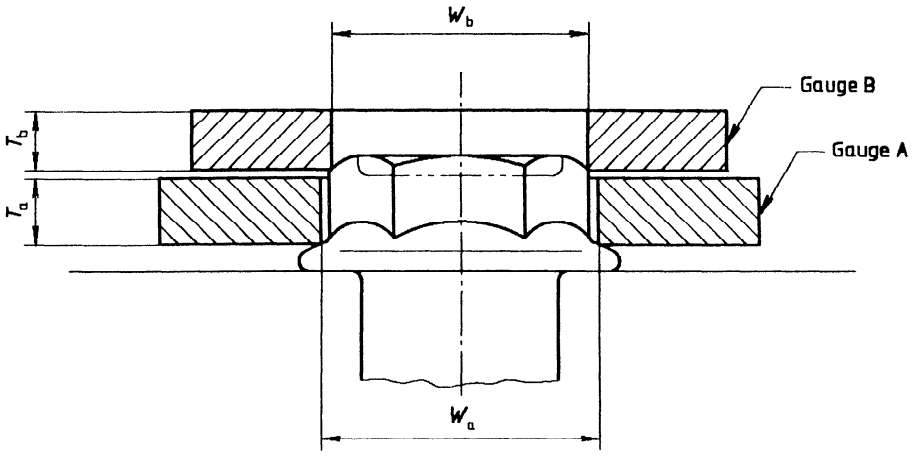
Annex A
(normative)

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.

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.



NOTE — $W_{a\ min}$ = theoretical maximum width across corners
$W_{b\ max}$ = minimum width across corner minus 0,01 mm
$T_{a\ max}$ = minimum wrenching height k'

Figure A.1

Table A.1

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

UDC 621.882.211.082.8

Descriptors: fasteners, screws, hexagonal head screws, sheet metal screws, dimensions, designation.

Price based on 5 pages