

JIS

JAPANESE INDUSTRIAL STANDARD

Cross recessed head tapping screws

JIS B 1122^{—1996}

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J I S

Cross recessed head tapping screws

B 1122-1996

1. Scope This Japanese Industrial Standard specifies the steel cross recessed head tapping screws (hereafter, referred to as "steel tapping screws") for general use.

Remarks 1. The cross recessed head tapping screws not in accordance with the text of this Standard are specified in the Annex.

2. The standards cited in this Standard are given in the following :

- JIS B 0101 Screw threads and fasteners – Vocabulary
 - JIS B 1007 Threads and thread ends for tapping screws
 - JIS B 1012 Cross recesses for screws
 - JIS B 1013 Countersunk head screws – Head configuration and gauging
 - JIS B 1014 Countersunk flat head screws – Part 2: Penetration depth of cross recesses
 - JIS B 1021 Tolerance system for threaded fasteners
 - JIS B 1044 Threaded components – Electroplated coatings
 - JIS B 1055 Tapping screws – Mechanical properties
 - JIS B 1071 Method of verification for size and geometry of threaded fasteners
 - JIS B 1091 Fasteners – Acceptance inspection
 - JIS G 3539 Carbon steel wires for cold heading and cold forging
 - JIS G 4051 Carbon steels for machine structural use
 - JIS G 4315 Stainless steel wires for cold heading and cold forging
3. The International Standards corresponding to this Standard are given in the following :
- ISO 7049 : 1983 Cross recessed pan head tapping screws
 - ISO 7050 : 1983 Cross recessed countersunk (flat) head tapping screws (common head style)
 - ISO 7051 : 1983 Cross recessed raised countersunk (oval) head tapping screws

2. Definitions The definitions of main terms used in this Standard are in accordance with JIS B 0101.

3. Classification The steel tapping screws shall be classified as given in Table 1 according to the shapes of head.

Table 1. Classification of steel tapping screws

Type	Types according to shapes of screw end	Corresponding International Standard
Cross recessed pan head tapping screws	Type C and Type F	ISO 7049 : 1983
Cross recessed countersunk head tapping screws		ISO 7050 : 1983
Cross recessed raised countersunk head tapping screws		ISO 7051 : 1983

Remarks : The types according to the shapes of screw end shall be in accordance with the text of JIS B 1007.

4. Qualities The qualities of steel tapping screws shall be in accordance with Table 2.

Table 2. Qualities of steel tapping screws

Division	Quality
Screw threads	To be in accordance with the Type C or Type F of the text of JIS B 1007.
Mechanical properties	To be in accordance with 4. of the text of JIS B 1055.
Tolerances	To be in accordance with the product grade A of JIS B 1021.
Cross recess	To be in accordance with the Type H or Type Z of JIS B 1012.
Surface treatment	In general, the surface treatment is not processed. When the surface treatment of plating or the like is required, the purchaser shall designate. Further, when the electroplating is to be processed, it shall be in accordance with JIS B 1044.
Surface conditions	The surface shall be smooth, and be free from harmful defects in use such as cracks, flaws, flashes, burrs, rust and the like.

5. Shapes and dimensions The shapes and dimensions of steel tapping screws shall be in accordance with Attached Tables 1 to 3.

6. Material The material of steel tapping screws shall be in accordance with 3. of the text of JIS B 1055.

7. Inspections The inspections of steel tapping screws shall be in accordance with the following :

- (1) The inspection of mechanical properties shall be carried out in accordance with 6. of the text of JIS B 1055, and the results shall conform to the requirements specified in 4. of the text of JIS B 1055.
- (2) The inspection on shapes and dimensions of threaded portions shall be carried out by the direct measurements, and the results shall conform to 3. of the text of JIS B 1007.
- (3) In the inspection on shapes and dimensions of cross recesses, the gauge penetration depth (q) shall be measured in accordance with 3.2.2 or 4.2.2 of JIS B 1012, and its value shall conform to the values (q) of Attached Tables 1 to 3.

The wing length m of cross recess shall not be taken as the object of the inspection.

Remarks : The inspection on the engagement of Type H cross recessed head tapping screws with gauge shall be as agreed between the purchaser and the manufacturer, and unless particularly impedimental, it shall be carried out in accordance with 3.2.3 of JIS B 1012, and be considered to be acceptable when the tapping screw does not fall out by the self mass. However, for those of nominal length (l) exceeding five times the nominal diameter of screw thread (nominal value of thread), it shall be exempt from application.

The inspection on the engagement is not specified in the corresponding International Standard.

- (4) The inspection on shapes and dimensions of portions except the threaded portion and cross recess shall be carried out in accordance with the measuring methods on dimensions of respective parts of JIS B 1071 or the method instead of that, and the values thereof shall conform to the values of Attached Tables 1 to 3.

Further, the inspection on geometrical tolerances shall be carried out in accordance with the measuring method of the geometrical deviations of JIS B 1071 or the method instead of that, and the results shall conform to the tolerances of product grade A specified in JIS B 1021.

In addition, the shape and dimensions of countersunk head part of Attached Table 2 should preferably be in accordance with the gauge inspection specified in JIS B 1013.

- (5) The inspection on surface conditions shall be carried out visually, and the results shall conform to Table 2.
- (6) The acceptance inspection, unless particularly designated, shall be in accordance with JIS B 1091.

8. Designation The steel tapping screws shall be designated by the Standard number ⁽¹⁾, type of steel tapping screws, type according to shape of screw end, designation of thread $\times$ nominal length (l), type of cross recess and designated matter ⁽²⁾.

Notes ⁽¹⁾ The Standard number, unless particularly required, may be omitted.

⁽²⁾ As to the designated matter, type of surface treatment or the like shall be indicated as required.

Examples :

JIS B 1122	Cross recessed pan head tapping screw	— Type C —	ST3.5 $\times$ 13	— H —	A2K ⁽³⁾
JIS B 1122	Cross recessed countersunk head tapping screw	— Type F —	ST4.8 $\times$ 16	— H	
	Cross recessed raised countersunk head tapping screw	— Type F —	ST4.8 $\times$ 16	— Z	
 (Standard number)	 (Type of steel tapping screws)	 (Type of screw end)	 (Designation of thread $\times l$)	 (Type of cross recess)	 (Designated matter)

Note ⁽³⁾ A2K is the symbol in Annex D to JIS B 1044.

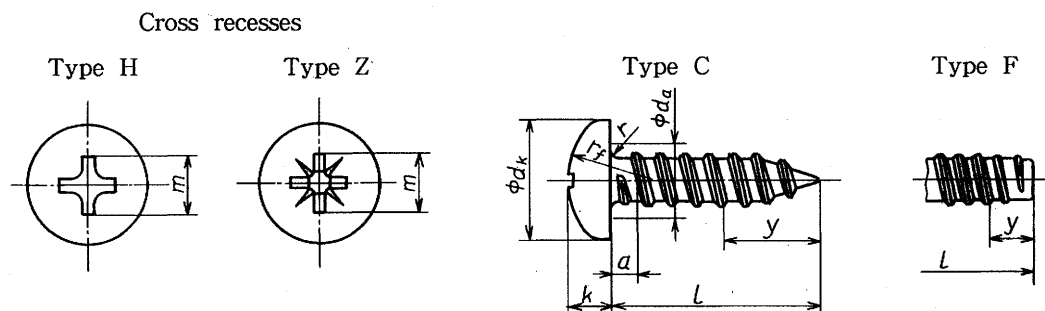
9. Markings

9.1 Marking on products The marking on products of steel tapping screws shall not generally be made.

9.2 Marking on package The package of steel tapping screws shall be marked with the following matters on the outer face.

- (1) Type of steel tapping screws
- (2) Type according to shapes of screw end
- (3) Designation of threads $\times$ nominal length (*l*)
- (4) Type of cross recess (Indicate the distinction of Type H or Type Z.)
- (5) Designated matter
- (6) Quantity
- (7) Manufacturer's name or abbreviation ⁽⁴⁾

Note ⁽⁴⁾ As to the abbreviation, its registered trademark should preferably be used as far as possible.

Attached Table 1. Shape and dimensions of cross recessed pan head tapping screws
(Type C and Type F)

Unit : mm

Designation of thread				ST2.2	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3	ST8	ST9.5	
Pitch (<i>P</i>)				0.8	1.1	1.3	1.4	1.6	1.8	1.8	2.1	2.1	
<i>a</i> ⁽⁵⁾			Max.	0.8	1.1	1.3	1.4	1.6	1.8	1.8	2.1	2.1	
<i>d_a</i>			Max.	2.8	3.5	4.1	4.9	5.6	6.3	7.3	9.2	10.7	
<i>d_k</i>			Max.	4	5.6	7	8	9.5	11	12	16	20	
			Min.	3.7	5.3	6.64	7.64	9.14	10.57	11.57	15.57	19.48	
<i>k</i>			Max.	1.6	2.4	2.6	3.1	3.7	4	4.6	6	7.5	
			Min.	1.4	2.15	2.35	2.8	3.4	3.7	4.3	5.6	7.1	
<i>r</i>			Min.	0.1	0.1	0.1	0.2	0.2	0.25	0.25	0.4	0.4	
<i>r_f</i>			Approx.	3.2	5	6	6.5	8	9	10	13	16	
Cross recess No.				0	1	2			3		4		
Cross recesses	Type H	<i>m</i>	Ref.	1.9	3	3.9	4.4	4.9	6.4	6.9	9	10.1	
		Gauge penetration depth (<i>q</i>)	Min.	0.85	1.4	1.4	1.9	2.4	2.6	3.1	4.15	5.2	
			Max.	1.2	1.8	1.9	2.4	2.9	3.1	3.6	4.7	5.8	
	Type Z	<i>m</i>	Ref.	2	3	4	4.4	4.8	6.2	6.8	8.9	10.1	
		Gauge penetration depth (<i>q</i>)	Min.	0.95	1.45	1.5	1.95	2.3	2.55	3.05	4.05	5.25	
			Max.	1.2	1.75	1.9	2.35	2.75	3	3.5	4.5	5.7	
<i>y</i> ⁽⁶⁾			Type C	2	2.6	3.2	3.7	4.3	5	6	7.5	8	
(Ref.)			Type F	1.6	2.1	2.5	2.8	3.2	3.6	3.6	4.2	4.2	
<i>l</i> ⁽⁷⁾													
Nominal length		Type C		Type F									
		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							—	—
16		15.2	16.8	15.2	16								
19		18.2	19.8	18.2	19								
22		21.2	22.8	20.7	22								
25		24.2	25.8	23.7	25								
32		30.7	33.3	30.7	32								
38		36.7	39.3	36.7	38								
45		43.7	46.3	43.5	45								
50		48.7	51.3	48.5	50								