

JIS

JAPANESE INDUSTRIAL STANDARD

Cross recessed head screws

 **JIS B 1111—1996**

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J I S



Cross recessed head screws

B 1111-1996

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

Remarks 1. When the steel screws, stainless steel screws and nonferrous metal screws are generically called, these are simply called "screws".

2. The screws not in accordance with the text of this Standard are specified in the Annex.

3. The standards cited in this Standard are given in the Attached Table 5.

4. The International Standards corresponding to the text of this Standard are given in the Attached Table 6.

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

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

Table 1. Classification of screws

Type	Corresponding International Standard
Cross recessed pan head screws	ISO 7045 : 1994
Cross recessed countersunk head screws	ISO 7046-1 : 1994 ISO 7046-2 : 1990
Cross recessed raised countersunk head screws	ISO 7047 : 1994

4. Qualities The qualities (1) of the screws shall be in accordance with Table 2. The geometrical tolerances and surface conditions of screws shall be in accordance with the following :

- (1) The geometrical tolerances of screws shall be in accordance with JIS B 1021 Attached Table 1.
- (2) The permissible limits in respect to the surface discontinuities of screws, unless particularly designated, shall be in accordance with JIS B 1041 or JIS B 1043.
- (3) The screws shall generally be not processed with surface treatment. Particularly when the surface treatment of plating or the like is required, it shall be designated by the purchaser.

When the electroplating is to be processed, JIS B 1044 shall be referred to.

Note (1) Product grade, tolerance class of screw threads and mechanical properties.

Table 2. Quality of screws

Type of screw	Product grade ⁽²⁾	Shape and dimensions	Screw thread			Material		Mechanical properties	
			Cross recess ⁽³⁾	Type ⁽⁴⁾	Range of designation	Tolerance class ⁽⁵⁾	Steel	Strength class	Applicable standard
							Stainless steel	Property class	
							Nonferrous metal	Material symbol	
Cross recessed pan head screws	A	Attached Table 1	Type H or Type Z	Coarse thread	M1.6 to M10	6 g	Steel	4.8	JIS B 1051
							Stainless steel	A2-50, A2-70	JIS B 1054
							Nonferrous metal	— ⁽⁶⁾	JIS B 1057
Cross recessed countersunk head screws	A	Attached Table 2	Type H or Type Z	Coarse thread	M1.6 to M10	6 g	Steel	4.8	JIS B 1051
							Steel	8.8	JIS B 1051
	A	Attached Table 3	Type H or Type Z	Coarse thread	M2 to M10	6 g	Stainless steel	A2-70	JIS B 1054
							Nonferrous metal	CU2, CU3	JIS B 1057
Cross recessed raised countersunk head screws	A	Attached Table 4	Type H or Type Z	Coarse thread	M1.6 to M10	6 g	Steel	4.8	JIS B 1051
							Stainless Steel	A2-50, A2-70	JIS B 1054
							Nonferrous metal	— ⁽⁶⁾	JIS B 1057

Notes ⁽²⁾ A of product grade shall be in accordance with JIS B 1021.

⁽³⁾ The shapes and dimensions of cross recesses shall be in accordance with JIS B 1012. However, the wing length of cross recess (*m*) and penetration depth of gauge (*q*) shall be in accordance with Attached Tables 1 to 4.

⁽⁴⁾ The types of screw thread shall be in accordance with JIS B 0205.

⁽⁵⁾ The tolerance class of screw thread shall be in accordance with JIS B 0209.

The maximum permissible dimension of the screw thread electroplated shall be that of tolerance class 4h in accordance with the text of JIS B 0209.

⁽⁶⁾ As to the material symbol of nonferrous metal, any one among the material symbols specified in JIS B 1057 shall be determined upon an agreement between the purchaser and the manufacturer.

5. Shapes and dimensions The shapes and dimensions of the screws shall be in accordance with Attached Tables 1 to 4.

6. Materials The materials of the screws shall be in accordance with the following:

- (1) The material of steel screws shall be in accordance with 3. of the text of JIS B 1051.
- (2) The material of stainless steel screws shall be in accordance with 5. of JIS B 1054.
- (3) The material of nonferrous metal screws shall be in accordance with 4. of JIS B 1057.

7. Inspections The inspection of screws shall be in accordance with the following:

- (1) The inspection on the mechanical properties shall be carried out in accordance with JIS B 1051 for the steel screws, with JIS B 1054 for stainless steel screws, and with JIS B 1057 for nonferrous metal screws, and the results shall conform to the strength class, property class and material symbol of Table 2.
- (2) The inspection on the shapes and dimensions (except cross recess), screw threads and geometrical tolerances shall be carried out by the measuring method in accordance with JIS B 1071 or a method instead of this, and the results shall conform to Table 2 and Attached Tables 1 to 4. However, as to the go ring gauge on the screw threads processed with the electroplating, that for 4 h in accordance with JIS B 0251 shall be used.

As to the shapes and dimensions of countersunk head of Attached Tables 2 and 3, the gauge inspection specified in JIS B 1013 should be preferable.

- (3) The inspection of the cross recess shall be carried out by measuring in accordance with 3.2.2 or 4.2.2 of JIS B 1012, and the results shall conform to the value of gauge penetration depth (q) of Attached Tables 1 to 4.

The wing length (m) of cross recess shall be excluded from the object of inspection.

Remarks : The inspection on the engagement of the cross recess of Type H cross recessed head screw with the 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 it shall be considered to be acceptable when the screw does not fall down by the self mass. However, this shall not be applied to that of which nominal length (l) is 7 times or over the nominal diameter (d) of screw thread.

This inspection on the engagement is not specified in the corresponding International Standards.

- (4) The inspection on the surface discontinuities, unless particularly designated, shall be carried out in accordance with JIS B 1041 or JIS B 1043, and the results shall conform to the permissible limits specified in these standards.
- (5) The acceptance inspection, unless particularly designated, shall be in accordance with JIS B 1091.

8. Designation The screws shall be designated by the Standard number, type of screws, product grade, designation of thread (d) \times nominal length (l), symbol of strength class of mechanical properties (symbol of property class in the case of stainless steel screw, material symbol in the case of nonferrous metal screw), type of cross recess (⁽⁷⁾) and designated matter.

Note (⁽⁷⁾) As to the cross recessed countersunk head screw of Attached Table 3, when the identification of series 1 (deep type) and series 2 (shallow type) of cross recess is required, series number (1 or 2) shall be appended in succession after the type (H or Z) of cross recess (for example H1, H2).

Remarks 1. The Standard number, unless particularly required, may also be omitted.

2. As to the designated matter, the shape of screw end, type of surface treatment, etc. shall be indicated as required.

Examples :

(In the case of steel screw of Attached Table 1)	JIS B 1111	Cross recessed pan head screw	- A	- M5 × 20 - 4.8	- H	- A2K (*)	
(In the case of steel screw of Attached Table 2)	JIS B 1111	Cross recessed countersunk head screw	- A	- M5 × 20 - 4.8	- H		
(In the case of nonferrous metal screw of Attached Table 3)		Cross recessed countersunk head screw	- A	- M5 × 20 - CU2	- H1	- Flat point	
(In the case of stainless screw of Attached Table 4)		Cross recessed raised countersunk head screw	- A	- M5 × 20 - A2-70	- Z		
	(Standard number)	(Type of screw)	(Product grade)	(d × l)	(Symbol of strength class)	(Type of cross recess)	(Designated matter)

Note (*) A2K is in accordance with the symbol in Annex D to JIS B 1044.

9. Markings

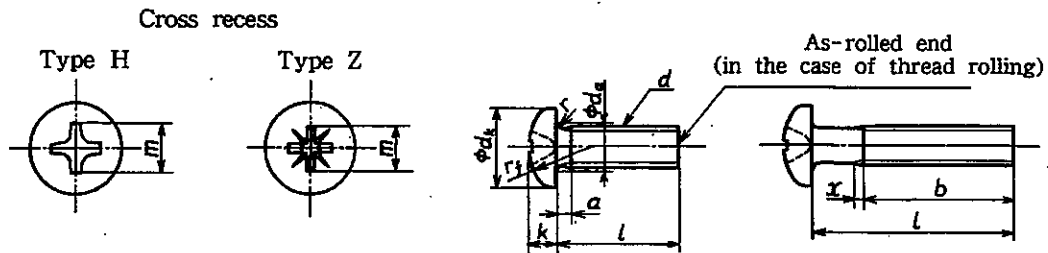
9.1 Marking on products The marking on products of the screws shall be in accordance with the following :

- (1) The steel screws shall be in accordance with 6.1 of JIS B 1051.
- (2) The stainless steel screws shall be in accordance with 8.1 of JIS B 1054.
- (3) The nonferrous metal screws shall be in accordance with 7.1 of JIS B 1057.

9.2 Marking on packages The packages of screws shall be marked with the following information on the outer face.

- (1) Type of screw
- (2) Designation of thread × nominal length
- (3) Symbol of strength class (in the case of steel screws),
Symbol of property class (in the case of stainless steel screws, the combined symbol of steel type and strength class),
Symbol of material symbol (in the case of nonferrous metal screws)
- (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 (For the abbreviation, its registered trademark should be used as far as possible.)

Attached Table 1. Shape and dimensions of cross recessed pan head screws



Unit: mm

Designation of thread d ⁽⁹⁾			M1.6	M2	M2.5	M3	(M3.5)	M4	M5	M6	M8	M10	
Pitch (P)			0.35	0.4	0.45	0.5	0.6	0.7	0.8	1	1.25	1.5	
a	Max.		0.7	0.8	0.9	1	1.2	1.4	1.6	2	2.5	3	
b	Min.		25	25	25	25	38	38	38	38	38	38	
d_a	Max.		2	2.6	3.1	3.6	4.1	4.7	5.7	6.8	9.2	11.2	
d_k	Nom. = Max.		3.2	4.0	5.0	5.6	7.00	8.00	9.50	12.00	16.00	20.00	
	Min.		2.9	3.7	4.7	5.3	6.64	7.64	9.14	11.57	15.57	19.48	
k	Nom. = Max.		1.30	1.60	2.10	2.40	2.60	3.10	3.70	4.6	6.0	7.50	
	Min.		1.16	1.46	1.96	2.26	2.46	2.92	3.52	4.3	5.7	7.14	
r	Min.		0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.25	0.4	0.4	
r_f	Approx.		2.5	3.2	4	5	6	6.5	8	10	13	16	
x	Max.		0.9	1	1.1	1.25	1.5	1.75	2	2.5	3.2	3.8	
No. of cross recess			0		1		2		3		4		
Cross recesses	Type H	m	Ref.	1.7	1.9	2.7	3	3.9	4.4	4.9	6.9	9	10.1
		Penetration depth of gauge (q)	Max.	0.95	1.2	1.55	1.8	1.9	2.4	2.9	3.6	4.6	5.8
	Min.		0.70	0.9	1.15	1.4	1.4	1.9	2.4	3.1	4.0	5.2	
	Type Z	m	Ref.	1.6	2.1	2.6	2.8	3.9	4.3	4.7	6.7	8.8	9.9
		Penetration depth of gauge (q)	Max.	0.90	1.42	1.50	1.75	1.93	2.34	2.74	3.46	4.50	5.69
	Min.		0.65	1.17	1.25	1.50	1.48	1.89	2.29	3.03	4.05	5.24	
l ⁽¹⁰⁾			(Informative reference) Approximate mass per 1000 pieces in kg (Density : 7.85 kg/dm ³)										
Nominal length ⁽⁹⁾	Min.	Max.											
3	2.8	3.2	0.099	0.178	0.336								
4	3.76	4.24	0.111	0.196	0.366	0.544							
5	4.76	5.24	0.123	0.215	0.396	0.588	0.891	1.3					
6	5.76	6.24	0.134	0.233	0.426	0.632	0.951	1.38	2.32				
8	7.71	8.29	0.157	0.27	0.486	0.72	1.07	1.53	2.57	4.37			
10	9.71	10.29	0.18	0.307	0.546	0.808	1.19	1.69	2.81	4.72	9.96		
12	11.65	12.35	0.203	0.344	0.606	0.896	1.31	1.84	3.06	5.07	10.6	19.8	
(14)	13.65	14.35	0.226	0.381	0.666	0.984	1.43	2	3.31	5.42	11.2	20.8	
16	15.65	16.35	0.245	0.418	0.726	1.07	1.55	2.15	3.56	5.78	11.9	21.8	
20	19.58	20.42		0.492	0.846	1.25	1.79	2.46	4.05	6.48	13.2	23.8	
25	24.58	25.42			0.996	1.47	2.09	2.85	4.67	7.36	14.8	26.3	
30	29.58	30.42				1.69	2.39	3.23	5.29	8.24	16.4	28.8	
35	34.5	35.5					2.68	3.62	5.91	9.12	18	31.3	
40	39.5	40.5						4.01	6.52	10	19.6	33.9	
45	44.5	45.5							7.14	10.9	21.2	36.4	
50	49.5	50.5								11.8	22.8	38.9	
(55)	54.05	55.95								12.6	24.4	41.4	
60	59.05	60.95								13.5	26	43.9	

Notes ⁽⁹⁾ The designation of thread and nominal length in parentheses should not preferably be used.

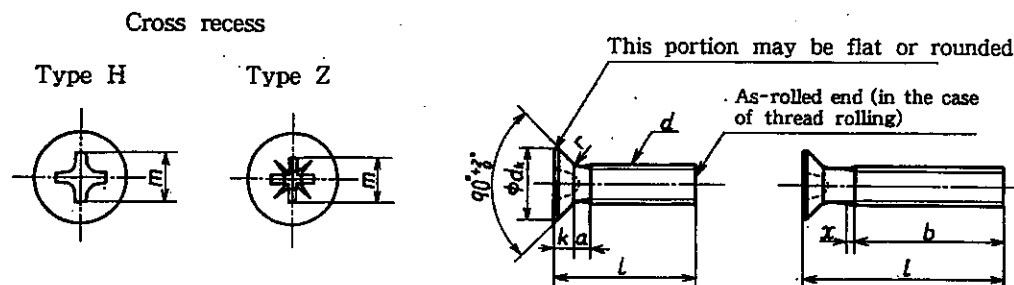
⁽¹⁰⁾ The preferable nominal length to the designations of thread shall be those given in the frame of bold lines, and those of shorter nominal length than the position of dotted lines shall be the full threads. In this case, $b = l - a$.

Remarks 1. The diameter of unthreaded part (body) shall generally be approximately the same as the pitch diameter of screw thread, but may also be approximately the same as the nominal diameter of screw thread.

However, its diameter shall be smaller than the maximum value of major diameter of thread.

2. The shape of screw end shall be as-rolled end in the case of thread rolling, and be as chamfered end in the case of screw thread cutting. When other screw end is required, it shall be designated by the purchaser, provided that the shape and dimensions of the screw end shall generally conform to the specification of JIS B 1003.

3. This Table is in accordance with ISO 7045.

Attached Table 2. Shape and dimensions of cross recessed countersunk head screws
(for strength class 4.8)

Unit : mm

Designation of thread d ⁽⁹⁾			M1.6	M2	M2.5	M3	(M3.5)	M4	M5	M6	M8	M10	
Pitch (P)			0.35	0.4	0.45	0.5	0.6	0.7	0.8	1	1.25	1.5	
a	Max.		0.7	0.8	0.9	1	1.2	1.4	1.6	2	2.5	3	
b	Min.		25	25	25	25	38	38	38	38	38	38	
d_k ⁽¹¹⁾	Max. of theoretical dimension		3.6	4.4	5.5	6.3	8.2	9.4	10.4	12.6	17.3	20	
	Actual dimension	Nom. = Max.	3.0	3.8	4.7	5.5	7.30	8.40	9.30	11.30	15.80	18.30	
		Min.	2.7	3.5	4.4	5.2	6.94	8.04	8.94	10.87	15.37	17.78	
k ⁽¹¹⁾	Nom. = Max.		1	1.2	1.5	1.65	2.35	2.7	2.7	3.3	4.65	5	
r	Max.		0.4	0.5	0.6	0.8	0.9	1	1.3	1.5	2	2.5	
x	Max.		0.9	1	1.1	1.25	1.5	1.75	2	2.5	3.2	3.8	
No. of cross recess			0		1		2			3	4		
(12) Cross recesses	Type H	m	Ref.	1.6	1.9	2.9	3.2	4.4	4.6	5.2	6.8	8.9	10
		Penetration depth of gauge (q)	Max.	0.9	1.2	1.8	2.1	2.4	2.6	3.2	3.5	4.6	5.7
			Min.	0.6	0.9	1.4	1.7	1.9	2.1	2.7	3.0	4.0	5.1
	Type Z	m	Ref.	1.6	1.9	2.8	3	4.1	4.4	4.9	6.6	8.8	9.8
		Penetration depth of gauge (q)	Max.	0.95	1.20	1.73	2.01	2.20	2.51	3.05	3.45	4.60	5.64
			Min.	0.70	0.95	1.48	1.76	1.75	2.06	2.60	3.00	4.15	5.19
l ⁽¹³⁾			(Informative reference) Approximate mass per 1000 pieces in kg (Density: 7.85 kg/dm ³)										
Nominal length ⁽⁸⁾		Min.	Max.										
3	2.8	3.2	0.058	0.101	0.176								
4	3.76	4.24	0.069	0.119	0.206	0.291							
5	4.76	5.24	0.081	0.137	0.236	0.335	0.573	0.825					
6	5.76	6.24	0.093	0.152	0.266	0.379	0.633	0.903	1.24				
8	7.71	8.29	0.116	0.193	0.326	0.467	0.753	1.06	1.48	2.38			
10	9.71	10.29	0.139	0.231	0.386	0.555	0.873	1.22	1.72	2.73	5.68		
12	11.65	12.35	0.162	0.268	0.446	0.643	0.993	1.37	1.96	3.08	6.32	9.54	
(14)	13.65	14.35	0.185	0.306	0.507	0.731	1.11	1.53	2.2	3.43	6.96	10.6	
16	15.65	16.35	0.208	0.343	0.567	0.82	1.23	1.68	2.44	3.78	7.6	11.6	
20	19.58	20.42		0.417	0.687	0.996	1.47	2	2.92	4.48	8.88	13.6	
25	24.58	25.42			0.838	1.22	1.77	2.39	3.52	5.36	10.5	16.1	
30	29.58	30.42				1.44	2.07	2.78	4.12	6.23	12.1	18.7	
35	34.5	35.5					2.37	3.17	4.72	7.11	13.7	21.2	
40	39.5	40.5						3.56	5.32	7.98	15.3	23.7	
45	44.5	45.5							5.92	8.86	16.9	26.2	
50	49.5	50.5							6.52	9.73	18.5	28.8	
(55)	54.05	55.95								10.6	20.1	31.3	
60	59.05	60.95								11.5	21.7	33.8	

Notes ⁽¹¹⁾ As to dimensions d_k and k , refer to JIS B 1013.⁽¹²⁾ The cross recesses are in accordance with the series 1 (deep) specified in JIS B 1014.

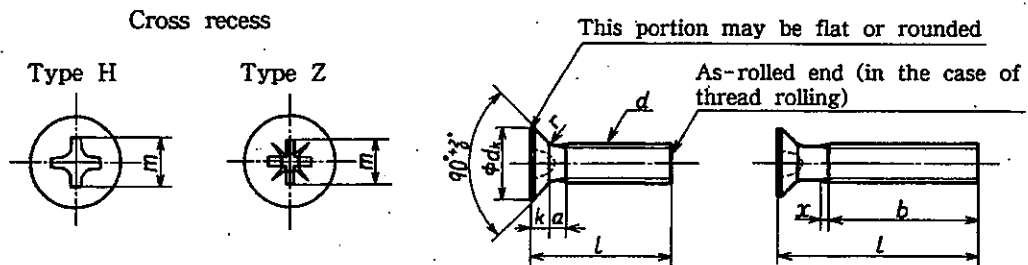
- (13) The preferable nominal lengths to the designations of thread shall be within the frame of bold lines, and those of shorter nominal length than the positions of broken lines shall be full threads. In this case, $b = l - (k + a)$.

Remarks 1. The diameter of unthreaded portion (body) shall generally be approximately pitch diameter of screw thread, but may be approximately the nominal diameter of screw thread.

However, its diameter shall be smaller than the maximum value of major diameter of screw thread.

2. The shape of screw end shall be as-rolled end in the case of thread rolling, and be as chamfered end in the case of thread cutting. When any other screw end is required, purchaser shall designate. However, the shape and dimension of the screw end shall generally be in accordance with JIS B 1003.
3. This Table is in accordance with ISO 7046-1.

Attached Table 3: Shape and dimensions of cross recessed countersunk head screws
(For strength class 8.8, for property class A2-70, and for material symbol CU2•CU3)



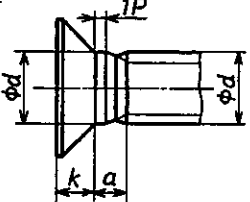
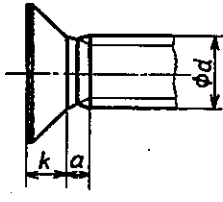
Unit : mm

Designation of thread d (°)				M2	M2.5	M3	(M3.5)	M4	M5	M6	M8	M10			
Pitch (P)				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 ⁽¹¹⁾		Max. of theoretical dimension		4.4	5.5	6.3	8.2	9.4	10.4	12.6	17.3	20			
		Actual dimension	Nom. = Max.	3.8	4.7	5.5	7.3	8.4	9.3	11.3	15.8	18.3			
			Min.	3.5	4.4	5.2	6.9	8.0	8.9	10.9	15.4	17.8			
k ⁽¹¹⁾		Nom. = Max.		1.2	1.5	1.65	2.35	2.7	2.7	3.3	4.65	5			
r		Max.		0.5	0.6	0.8	0.9	1	1.3	1.5	2	2.5			
x		Max.		1	1.1	1.25	1.5	1.75	2	2.5	3.2	3.8			
No. of cross recess				0	1			2		3		4			
<div>Cross recesses</div> <div>⁽¹⁴⁾</div>	Series 1 (Deep)	Type H	m	Ref.	1.9	2.9	3.2	4.4	4.6	5.2	6.8	8.9	10		
			Gauge penetration depth(q)	Max.	1.2	1.8	2.1	2.4	2.6	3.2	3.5	4.6	5.7		
				Min.	0.9	1.4	1.7	1.9	2.1	2.7	3.0	4.0	5.1		
		Type Z	m	Ref.	1.9	2.8	3	4.1	4.4	4.9	6.6	8.8	9.8		
			Gauge penetration depth(q)	Max.	1.20	1.73	2.01	2.20	2.51	3.05	3.45	4.60	5.64		
				Min.	0.95	1.48	1.76	1.75	2.06	2.60	3.00	4.15	5.19		
	Series 2 (Shallow)	Type H	m	Ref.	1.9	2.7	2.9	4.1	4.6	4.8	6.6	8.7	9.6		
			Gauge penetration depth(q)	Max.	1.2	1.55	1.8	2.1	2.6	2.8	3.3	4.4	5.3		
				Min.	0.9	1.25	1.4	1.6	2.1	2.3	2.8	3.9	4.8		
		Type Z	m	Ref.	1.9	2.5	2.8	4	4.4	4.6	6.3	8.5	9.4		
			Gauge penetration depth(q)	Max.	1.20	1.47	1.73	2.05	2.51	2.72	3.18	4.32	5.23		
				Min.	0.95	1.22	1.48	1.61	2.06	2.27	2.73	3.87	4.78		
				l ⁽¹³⁾											
			Nominal length (°)		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 (14) The dimensions of series 1 (Deep) and series 2 (Shallow) of cross recesses are in accordance with JIS B 1014.

Further, the combination of series 1 (Deep) • series 2 (Shallow) and shape of screw underhead part (underhead nominal diameter type, underhead pitch diameter type) for the division of mechanical properties shall be as given

in the following Table. However, the selection of series 1 or series 2, unless particularly designated, shall be the manufacture's option.

Material	Mechanical property division	For Series 1 (Deep)	For Series 2 (Shallow)
Steel	Strength class 8.8	Underhead nominal diameter type 	Underhead pitch diameter type 
Stainless steel	Property class A2-70		
Nonferrous metal	Material symbol CU2 or CU3	$a \text{ Max.} = 2.5P$	$a \text{ Max.} = 2P$

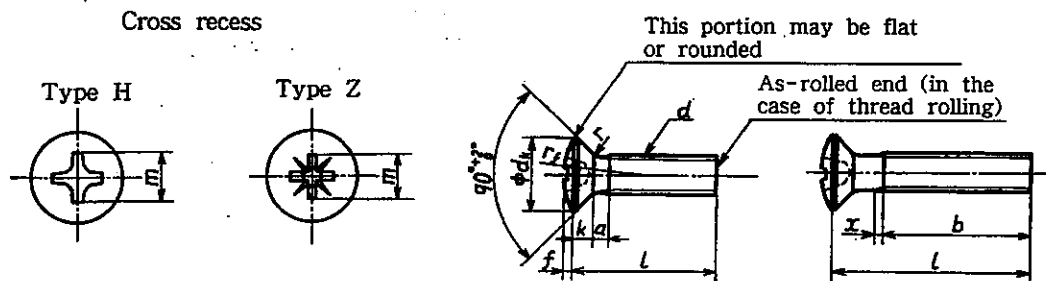
Remarks 1. The diameter of unthreaded body excepting underhead part of the underhead nominal diameter type shall generally be approximately pitch diameter, but may also approximately be as the nominal diameter of screw thread. However, its diameter shall be smaller than the maximum major diameter of screw thread.

2. The shape of the screw end shall be the as-rolled end in the case of thread rolling, and be the chamfered end in the case of thread cutting. When any other screw end is required, purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.

3. This Table is in accordance with ISO 7046-2.

Further, in the column of inside the bold lined frame of Table of preferable nominal length, of other Attached Tables, the approximate mass (informative reference value) per 1000 pieces is mentioned, but in ISO 7046-2 it has not been mentioned, so that in this Attached Table the column is left blank.

Attached Table 4. Shape and dimensions of cross recessed raised countersunk head screws



Unit : mm

Designation of thread d ⁽⁹⁾			M1.6	M2	M2.5	M3	(M3.5)	M4	M5	M6	M8	M10		
Pitch (P)			0.35	0.4	0.45	0.5	0.6	0.7	0.8	1	1.25	1.5		
a	Max.		0.7	0.8	0.9	1	1.2	1.4	1.6	2	2.5	3		
b	Min.		25	25	25	25	38	38	38	38	38	38		
d_k ⁽¹¹⁾	Max. of theoretical dimension		3.6	4.4	5.5	6.3	8.2	9.4	10.4	12.6	17.3	20		
	Actual dimension	Nom. = Max.	3.0	3.8	4.7	5.5	7.30	8.40	9.30	11.30	15.80	18.30		
		Min.	2.7	3.5	4.4	5.2	6.94	8.04	8.94	10.87	15.37	17.78		
f	Approx.		0.4	0.5	0.6	0.7	0.8	1	1.2	1.4	2	2.3		
k ⁽¹¹⁾	Nom. = Max.		1	1.2	1.5	1.65	2.35	2.7	2.7	3.3	4.65	5		
r	Max.		0.4	0.5	0.6	0.8	0.9	1	1.3	1.5	2	2.5		
r_f	Approx.		3	4	5	6	8.5	9.5	9.5	12	16.5	19.5		
x	Max.		0.9	1	1.1	1.25	1.5	1.75	2	2.5	3.2	3.8		
No. of cross recess			0			1			2		3	4		
Cross recess	Type H	m	Ref.	1.9	2	3	3.4	4.8	5.2	5.4	7.3	9.6	10.4	
		Gauge penetration depth (q)	Max.	1.2	1.5	1.85	2.2	2.75	3.2	3.4	4.0	5.25	6.0	
			Min.	0.9	1.2	1.50	1.8	2.25	2.7	2.9	3.5	4.75	5.5	
	Type Z	m	Ref.	1.9	2.2	2.8	3.1	4.6	5	5.3	7.1	9.5	10.3	
		Gauge penetration depth (q)	Max.	1.20	1.40	1.75	2.08	2.70	3.10	3.35	3.85	5.20	6.05	
			Min.	0.95	1.15	1.50	1.83	2.25	2.65	2.90	3.40	4.75	5.60	
l ⁽¹³⁾			(Informative reference) Approximate mass per 1000 pieces in kg (Density : 7.85 kg/dm ³)											
Nominal length ⁽⁹⁾			Min.	Max.										
3	2.8	3.2	0.067	0.119	0.212									
4	3.76	4.24	0.078	0.138	0.242	0.351								
5	4.76	5.24	0.09	0.156	0.272	0.395	0.669	0.99						
6	5.76	6.24	0.102	0.175	0.302	0.439	0.729	1.07	1.49					
8	7.71	8.29	0.125	0.212	0.362	0.527	0.849	1.23	1.73	2.79				
10	9.71	10.29	0.145	0.249	0.422	0.615	0.969	1.39	1.97	3.14	6.89			
12	11.65	12.35	0.165	0.287	0.482	0.703	1.09	1.54	2.21	3.49	7.53	11.4		
(14)	13.65	14.35	0.185	0.325	0.543	0.791	1.21	1.7	2.45	3.84	8.17	12.5		
16	15.65	16.35	0.205	0.362	0.603	0.879	1.33	1.85	2.69	4.19	8.81	13.5		
20	19.58	20.42		0.436	0.723	1.06	1.57	2.17	3.17	4.89	10.1	15.5		
25	24.58	25.42			0.874	1.28	1.87	2.56	3.77	5.77	11.7	18		
30	29.58	30.42				1.5	2.17	2.95	4.37	6.64	13.3	20.6		
35	34.5	35.5					2.47	3.34	4.97	7.52	14.9	23.1		
40	39.5	40.5						3.73	5.57	8.39	16.5	25.6		
45	44.5	45.5							6.16	9.27	18.1	28.1		
50	49.5	50.5							6.76	10.1	19.7	30.7		
(55)	54.05	55.95								11	21.3	33.2		
60	59.05	60.95								11.9	22.9	35.7		

- Remarks
1. The diameter of unthreaded portion (body) shall generally be approximately pitch diameter of screw thread, but may be approximately the nominal diameter of screw thread. However, its diameter shall be smaller than the maximum value of major diameter of screw thread.
 2. The shape of screw end shall be as-rolled end in the case of thread rolling, and be as chamfered end in the case of thread cutting. When any other screw end is required, purchaser shall designate. However, the shape and dimension of the screw end shall generally be in accordance with JIS B 1003.
 3. This Table is in accordance with ISO 7047.

Attached Table 5. Cited standards

JIS B 0101	Screw threads and fasteners – Vocabulary
JIS B 0205	Metric coarse screw threads
JIS B 0209	Limits of sizes and tolerances for metric coarse screw threads
JIS B 0251	Limit gauges for metric coarse screw threads
JIS B 1003	Ends of parts with external metric screw thread
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 1041	Fasteners – Surface discontinuities – Part 1: Bolts, screws and studs for general requirements
JIS B 1043	Fasteners – Surface discontinuities – Part 3: Bolts, screws and studs for special requirements
JIS B 1044	Threaded components – Electroplated coatings
JIS B 1051	Mechanical properties of steel bolts and screws
JIS B 1054	Specification for corrosion-resistant stainless steel fasteners
JIS B 1057	Mechanical properties of non-ferrous metal fasteners
JIS B 1058	Mechanical properties of fasteners Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm
JIS B 1071	Method of verification for size and geometry of threaded fasteners
JIS B 1091	Fasteners – Acceptance inspection
JIS G 4315	Stainless steel wires for cold heading and cold forging
JIS H 3260	Copper and copper alloy wires

Attached Table 6. Corresponding International Standards

ISO 7045 : 1994	Pan head screws with type H or type Z cross recess – Product grade A
ISO 7046-1 : 1994	Countersunk flat head screws (common head style) with type H or type Z cross recess – Product grade A – Part 1: Steel of property class 4.8
ISO 7046-2 : 1990	Cross recessed countersunk flat head screws (common head style) – Grade A – Part 2: Steel of property class 8.8, stainless steel and non-ferrous metals
ISO 7047 : 1994	Countersunk raised head screws (common head style) with type H or type Z cross recess – Product grade A

Annex

Cross recessed screws not in accordance with ISO 7045 to 7047

1. Scope This Annex specifies the steel cross recessed screws (hereafter, referred to as "steel screws"), stainless steel cross recessed screws (hereafter, referred to as "stainless steel screws") and brass cross recessed screws (hereafter, referred to as "brass screws") for general use not in accordance with ISO 7045 to 7047. Further, this Annex will be withdrawn in future. However, the strength class 4T of steel screws will be withdrawn on April 1st. 1999.

Remarks 1. In this Annex, when the steel screws, stainless steel screws, and brass screws are generically called, these are simply called "screws".

2. The shapes and dimensions of screws specified in this Annex are in accordance with JIS B 1111-1974, and the cross recesses thereof are in accordance with Type H of JIS B 1012.

2. Classification The screws shall be classified into 6 types of pan head screws, countersunk head screws, raised countersunk head screws, truss head screws, binding head screws and round head screws according to the shapes of head. However, the round head screws should not preferably be used as far as possible.

3. Mechanical properties

3.1 Mechanical properties of steel screws The mechanical properties of steel screws shall be in accordance with Annex Table 1.

Annex Table 1. Mechanical properties of steel screws

Screws to be applied	Mechanical properties		
	Strength class		Applicable standard
Steel screws	Column I	4.8	Text of JIS B 1051
		8.8	
	Column II	4T	Annex to JIS B 1051

3.2 Mechanical properties of stainless steel screws The mechanical properties of stainless steel screws shall be as agreed between the purchaser and the manufacturer. In this case, unless particularly impedimental, it should be preferable to apply the property class of JIS B 1054.

3.3 Mechanical properties of brass screws The mechanical properties of brass screws shall be as agreed between the purchaser and the manufacturer.

4. Shapes and dimensions

4.1 Shape and dimensions of cross recess The shape and dimensions of cross recesses shall be in accordance with the Type H of JIS B 1012. However, the wing lengths (m) and gauge penetration depth (q) of cross recesses shall be in accordance with Annex Attached Tables 1 to 6.

4.2 Shapes and dimensions other than cross recess The shapes and dimensions other than cross recess shall be in accordance with Annex Table 2.

Annex Table 2. Shapes and dimensions

Type of screws	Shape and dimensions	Range of designation of thread
Pan head screws	In accordance with Annex Attached Table 1.	M2 to M8
Countersunk head screws	In accordance with Annex Attached Table 2.	
Raised countersunk head screws	In accordance with Annex Attached Table 3.	
Truss head screws	In accordance with Annex Attached Table 4.	
Binding head screws	In accordance with Annex Attached Table 5.	
Round head screws	In accordance with Annex Attached Table 6.	

5. Screw threads The screw threads of screw shall be the metric coarse screw threads of JIS B 0205, and the tolerance class thereof shall be 6g of JIS B 0209.

6. Surface discontinuities The permissible limits in respect to the surface discontinuities of screws, unless particularly designated, shall be in accordance with JIS B 1041.

7. Materials The materials of the screws shall be in accordance with the following:

- (1) The material of steel screws shall be the carbon steel or alloy steel, the products of which satisfy the mechanical properties given in Annex Table 1.
- (2) The materials of stainless steel screws and brass screws shall generally be in accordance with Annex Table 3.

Annex Table 3. Materials

Division	Material
Stainless steel screws	JIS G 4315 ⁽¹⁾
Brass screws	C2700W of JIS H 3260

Note ⁽¹⁾ When JIS B 1054 has been applied to the mechanical properties of stainless steel screws, the material also should preferably be in accordance with that standard.

8. Surface treatment The screws shall generally be not processed with surface treatment. Particularly when the plating and other surface treatment are required, the purchaser shall designate.

Further, when the electroplating is to be processed, JIS B 1044 apply.

9. Inspections

9.1 Inspection on mechanical properties

9.1.1 Inspection on mechanical properties of steel screws The inspection on mechanical properties of steel screws shall be carried out in accordance with Annex Table 4 according to their strength classes, and the results shall conform to the

mechanical properties of 3.1.

Annex Table 4. Mechanical properties to be inspected and test methods of steel screws

Strength class		Mechanical properties to be inspected	Test method
Column I	4.8	In accordance with the program B of Table 7 in the text of JIS B 1051.	
	8.8		
Column II	4T	Tensile strength ⁽²⁾	In accordance with 3.2.2 in Annex to JIS B 1051.
		Hardness ⁽³⁾	In accordance with 3.2.4 in Annex to JIS B 1051.

Notes ⁽²⁾ The inspection on tensile strength of countersunk head screws and raised countersunk head screws shall be carried out by inserting into 90° countersunk.

⁽³⁾ The hardness shall be of Rockwell hardness, and when in accordance with any other hardness, it shall be as agreed between the purchaser and the manufacturer.

Remarks 1. The inspection for strength class column II shall be in accordance with the inspection program of Annex to JIS B 1051, but, when the tension test is impossible due to dimensional reason and the like, the acceptability shall be judged by the hardness.

Further, as to the screws of strength class column II, when yield point (or proof stress) and the elongation after fracture are required to examine, it shall be carried out in accordance with 4.2.1 of Annex to JIS B 1051.

2. As to the inspection on mechanical properties at the time of acceptance, a part of the tests may be omitted by such a method as to confirm the test result sheets as agreed between the purchaser and the manufacturer.

3. As to with strength class 8.8, those of under 3mm in nominal diameter of screw thread and those of 3 to 10mm in nominal diameter, when the tension test or wedge tension test is impossible due to shorter nominal length, the inspection may be carried out by the torsional strength test specified in JIS B 1058 instead of the inspection program B of the text of JIS B 1051.

9.1.2 Inspection on mechanical properties of stainless steel screws The inspection on mechanical properties of stainless steel screws shall be as agreed between the purchaser and the manufacturer.

Further, when JIS B 1054 has been applied, it shall be inspected in accordance with that standard.

9.1.3 Inspection on mechanical properties of brass screws The inspection on mechanical properties of brass screws shall be as agreed between the purchaser and the manufacturer.

9.2 Inspection on shapes and dimensions The inspection on shapes and dimensions shall be in accordance with the following :

- (1) The inspection on shapes and dimensions of cross recesses shall be carried out in accordance with 3.2.2 and 3.2.3 of JIS B 1012, and the results shall conform to 4.1.

Further, the wing length (m) of cross recess shall not be taken as the object of inspection.

In addition, the inspection on engagement of cross recess with gauge may be considered to be acceptable when the screw does not fall down by the self mass. However, that of nominal length (l) is 7 times or over the nominal diameter (d) shall be exempt from application.

- (2) The shapes and dimensions inspection shall be carried out by the direct measurement, limit gauges and other methods, and the results shall conform to 4.2.

9.3 Screw thread inspection The screw thread inspection shall be carried out by the limit gauges for screw thread specified in JIS B 0251 or screw thread inspecting instrument instead of this, and the results shall conform to 5.

Further, the go ring gauge used for the screw threads processed with electroplating shall be that for 4 h.

9.4. Inspection on surface discontinuities The inspection on surface discontinuities, unless particularly designated, shall be carried out in accordance with JIS B 1041, and the results shall conform to the permissible limits specified in JIS B 1041.

10. Designation The screws shall be designated by the Standard number (⁽⁴⁾), type (⁽⁵⁾), designation of thread (d) \times nominal length (l), strength class symbol (⁽⁶⁾) of mechanical properties, material and designated item (⁽⁷⁾). However, those which have applied JIS B 1051 and JIS B 1054 shall omit the material, and other than those shall omit the strength class of mechanical properties.

Further, when the thread length (b) has been designated with the value other than given in Annex Attached Table 7, the value of b enclosed in () shall be appended after l .

Notes (⁽⁴⁾) The Standard number, unless particularly required, may be omitted.

(⁽⁵⁾) When the Standard number has been omitted, the "cross recessed" shall be attached before the type.

(⁽⁶⁾) When the property class of JIS B 1054 has been applied to the stainless steel screws, it shall be treated the same as the strength class.

(⁽⁷⁾) As to the designated item, the thread length, surface treatment, shape of screw end, etc. shall be given as required.

Examples :

(In the case of steel screw)	JIS B 1111	Countersunk head screw	M 5 × 25	- 4.8		A2K ⁽⁹⁾
(In the case of stainless steel screw)	JIS B 1111	Pan head screw	M 6 × 50 (40)		SUS 305	
(In the case of brass screw)		Cross recessed countersunk head screw	M 2 × 10		C2700W	Flat point
	(Standard number)	(Type)	[d × l(b)]	(Strength class)	(Material)	(Designated matter)

Note ⁽⁸⁾ The designated item A2K is in accordance with the symbol of Annex D to JIS B 1044.

11. Marking

11.1 Marking on products The marking of products shall be in accordance with the following :

- (1) The marking on products for those of strength class column I of steel screws shall be in accordance with 6.1 of the text of JIS B 1051.
- (2) The marking on products for those of strength class column II of steel screws shall be in accordance with 5. of Annex to JIS B 1051.
- (3) The marking on products for stainless steel screws to which JIS B 1054 has been applied shall be in accordance with 8.1 of JIS B 1054.
- (4) The brass screws shall not be marked.

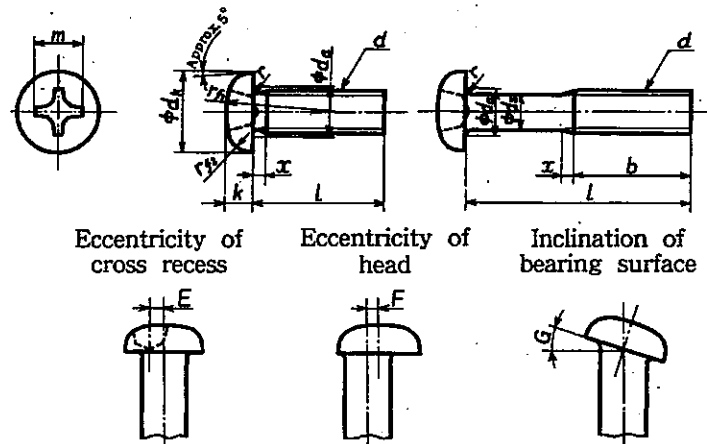
11.2 Marking on packages The packages shall be marked with the following information on the outer face.

- (1) Type (As to the type, it shall be so marked that it is of cross recessed.)
- (2) Designation of thread × l
- (3) Symbol of strength class (for the steel screws to which JIS B 1051 has been applied) or symbol of property class (for the stainless steel screws to which JIS B 1054 has been applied)
- (4) Material ⁽⁹⁾
- (5) Quantity and designated matter ⁽¹⁰⁾
- (6) Manufacturer's name or abbreviation

Notes ⁽⁹⁾ The marking of material shall be made on the stainless steel screws and brass screws. However, the material of stainless steel screws to which JIS B 1054 has been applied may also be omitted.
In addition, the material of steel screws to which JIS B 1051 has been applied shall generally be omitted.
Further, the marking of material may also be made by the general name of material.

⁽¹⁰⁾ When the thread length (b) has been designated with other value than given in Annex Attached Table 7, its value shall be indicated enclosing by () after l of (2).

Annex Attached Table 1. Shape and dimensions of pan head screws



Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_k		k		r_1	r_2	m	q ⁽¹¹⁾		r	d_a	E ⁽¹²⁾	F ⁽¹²⁾	G
			Basic size	Permissible deviation	Basic size	Permissible deviation	Approx.	Approx.	Ref.	Max.	Min.	Min.	Max.	Max.	Max.	Max.
* M2	0.4	1	3.5	0	1.3	± 0.1	4.5	0.6	2.2	1.01	0.60	0.1	2.6	0.15	0.1	2°
(M2.2)	0.45		4	-0.4	1.5		5	0.7	2.4	1.21	0.80	0.1	2.8	0.2	0.15	
* M2.5	0.45		4.5		1.7		6	0.8	2.6	1.42	1.00	0.1	3.1	0.2	0.15	
* M3	0.5	2	5.5	0	2	± 0.15	7	1.0	3.6	1.43	0.86	0.1	3.6	0.25	0.2	
* (M3.5)	0.6		6	-0.5	2.3		8	1.1	3.9	1.73	1.15	0.1	4.1	0.25	0.2	
* M4	0.7		7		2.6		9	1.3	4.2	2.03	1.45	0.2	4.7	0.3	0.2	
(M4.5)	0.75		8	0	2.9		11	1.5	4.6	2.43	1.84	0.2	5.2	0.35	0.25	
* M5	0.8		9	-0.6	3.3		12	1.6	4.9	2.73	2.14	0.2	5.7	0.35	0.25	
* M6	1	3	10.5	0	3.9	± 0.2	14	1.9	6.3	2.86	2.26	0.25	6.8	0.4	0.3	
* M8	1.25		14	0	5.2		18	2.6	7.8	4.36	3.73	0.4	9.2	0.5	0.4	

Notes ⁽¹¹⁾ The dimension q indicates the gauge penetration depth of the cross recess.⁽¹²⁾ E and F are the eccentricity in respect to shaft centre.

Remarks 1. In the Table, the designation of thread given in () should not preferably be used as far as possible.

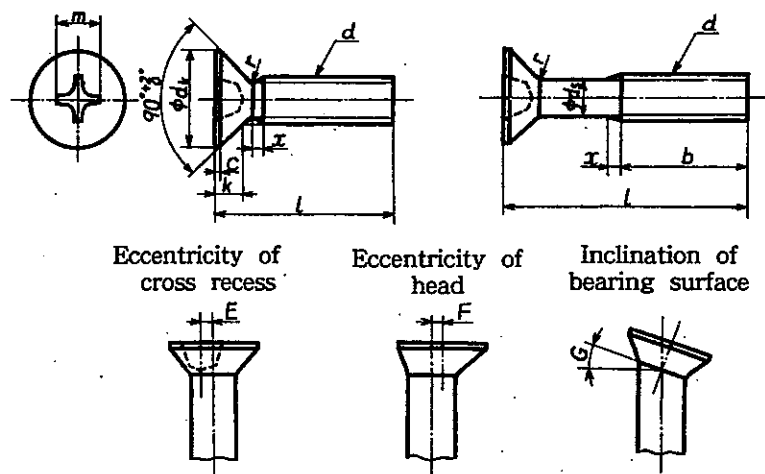
Further, those attached with * mark (except strength class 8.8) should preferably be in accordance with the cross recessed pan head screws of Attached Table 1 in the text for securing the internationality.

2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller

than the maximum value of major diameter of the screw thread.

4. The dimension x shall be approximately 2 threads.
5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.

Annex Attached Table 2. Shape and dimensions of countersunk head screws



Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_k		k ⁽¹³⁾		c	m	q ⁽¹¹⁾		r	E ⁽¹²⁾	F ⁽¹²⁾	G
			Basic size	Permissible deviation	Basic size	Permissible deviation	Approx.	Ref.	Max.	Min.	Approx.	Max.	Max.	Max.
* M2	0.4	1	4	0 -0.4	1.2	0 -0.2	0.2	2.2	1.01	0.65	0.2	0.15	0.1	2°
(M2.2)	0.45		4.4		1.3		0.2	2.4	1.21	0.85	0.22	0.2	0.15	
* M2.5	0.45		5		1.45		0.2	2.6	1.42	1.05	0.25	0.2	0.15	
* M3	0.5	2	6	0 -0.5	1.75	0 -0.3	0.25	3.6	1.43	0.91	0.3	0.25	0.2	
* (M3.5)	0.6		7		2		0.25	4.1	1.93	1.40	0.35	0.25	0.2	
* M4	0.7		8		2.3		0.3	4.5	2.33	1.79	0.4	0.3	0.2	
(M4.5)	0.75		9	0 -0.6	2.55		0.3	4.9	2.73	2.19	0.45	0.35	0.25	
* M5	0.8	3	10		2.8		0.3	5.1	2.93	2.38	0.5	0.35	0.25	
* M6	1		12	0 -0.7	3.4	0 -0.4	0.4	6.7	3.26	2.70	0.6	0.4	0.3	
* M8	1.25		16	0 -0.8	4.4		0.4	8.4	4.96	4.36	0.8	0.5	0.4	

Note ⁽¹³⁾ The height of head (k) shall be the value measured by taking the intersecting point of the extended line of nominal diameter of screw thread and the countersunk surface or its extended line as the starting point.

Remarks 1. In the Table, the designation of thread given in () should not preferably be used as far as possible.

Further, those attached with * mark should preferably be in accordance with the cross recessed countersunk head screws of Attached Table 2 or Attached Table 3 of the text for securing internationality.

2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.

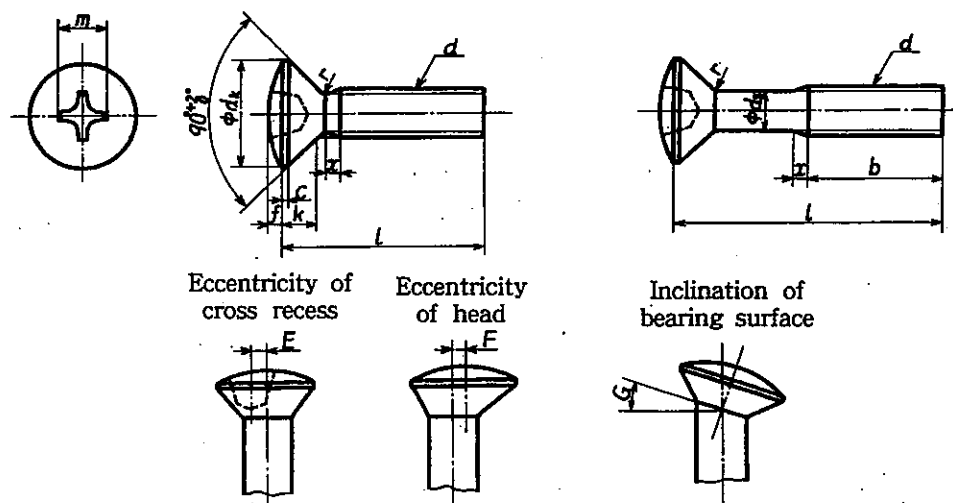
3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.

Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller

than the maximum value of major diameter of the screw thread.

4. The dimension x shall be approximately 2 threads.
5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.
6. The corner of the portion of c may be rounded.

Annex Attached Table 3. Shape and dimensions of raised countersunk head screws



Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_k		k ⁽¹³⁾		c		f	$k+f$		m	q ⁽¹¹⁾		r	E ⁽¹²⁾	F ⁽¹²⁾	G
			Basic size	Permissible deviation	Basic size	Permissible deviation	Approx.	Approx.	Basic size	Permissible deviation	Ref.	Max.	Max.	Approx.	Max.	Max.	Max.	
* M2	0.4	1	4	0	1.2	0	0.2	0.4	1.6	0	2.4	1.21	0.85	0.2	0.15	0.1	2°	
(M2.2)	0.45		4.4	-0.4	1.3	-0.2	0.2	0.5	1.8	-0.4	2.7	1.52	1.14	0.22	0.2	0.15		
* M2.5	0.45		5		1.45		0.2	0.55	2		2.9	1.72	1.34	0.25	0.2	0.15		
* M3	0.5	2	6	0	1.75	0	0.25	0.7	2.45	0	3.8	1.63	1.11	0.3	0.25	0.2		
(M3.5)	0.6		7	-0.5	2	-0.3	0.25	0.8	2.8	-0.5	4.3	2.13	1.60	0.35	0.25	0.2		
* M4	0.7		8		2.3		0.3	0.9	3.2		4.7	2.53	1.99	0.4	0.3	0.2		
(M4.5)	0.75		9	0	2.55		0.3	1	3.55		5.1	2.93	2.38	0.45	0.35	0.25		
* M5	0.8		10	-0.6	2.8		0.3	1.2	4		5.3	3.13	2.58	0.5	0.35	0.25		
* M6	1	3	12	0	3.4	0	0.4	1.4	4.8	0	6.9	3.46	2.90	0.6	0.4	0.3		
* M8	1.25		16	0	4.4	-0.4	0.4	1.8	6.2	-0.6	8.6	5.16	4.56	0.8	0.5	0.4		

Remarks 1. In the Table, the designation of thread given in () should not preferably be used as far as possible.

Further, those attached with * mark (except strength class 8.8) should preferably be in accordance with the cross recessed raised countersunk head screws of Attached Table 4. in the text.

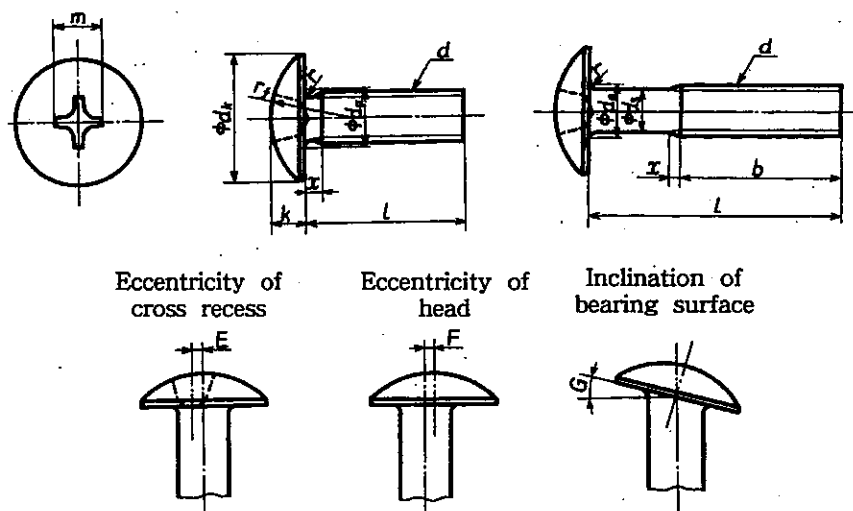
2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.

3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.

Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller than the maximum value of major diameter of the screw thread.

4. The dimension x shall be approximately 2 threads.
5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.
6. The corner of the portion of c may be rounded.

Annex Attached Table 4. Shape and dimensions of truss head screws

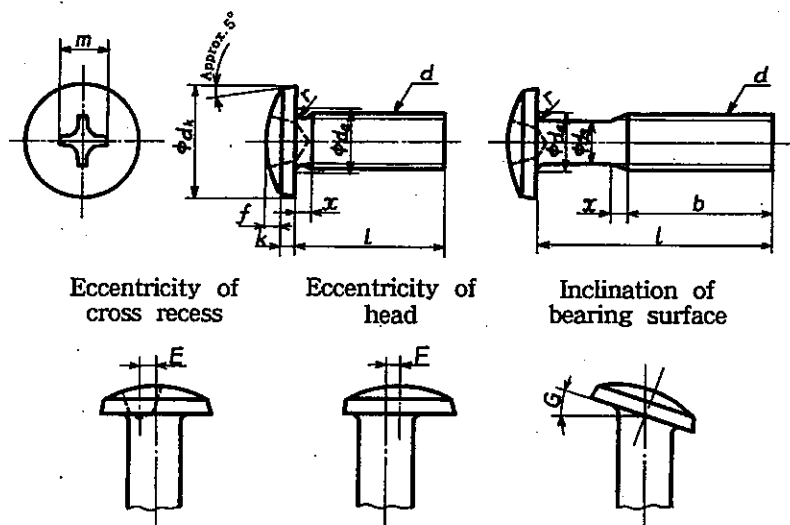


Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_s		k		r_f	m	$q^{(11)}$		r	d_a	$E^{(12)}$	$F^{(12)}$	G
			Basic size	Permissible deviation	Basic size	Permissible deviation	Approx.	Ref.	Max.	Min.	Min.	Max.	Max.	Max.	Max.
M2	0.4	1	4.5	0 -0.4	1.2	± 0.1	3	2.2	1.01	0.65	0.1	2.6	0.15	0.1	2*
(M2.2)	0.45		5		1.3		3.2	2.3	1.11	0.75	0.1	2.8	0.2	0.15	
M2.5	0.45		5.7		1.5		3.7	2.5	1.32	0.95	0.1	3.1	0.2	0.15	
M3	0.5		6.9	0 -0.5	1.9	± 0.15	4.6	2.9	1.72	1.34	0.1	3.6	0.25	0.2	
(M3.5)	0.6	2	8.1		2.2		5.4	4.0	1.83	1.30	0.1	4.1	0.25	0.2	
M4	0.7		9.4		2.5		6.1	4.3	2.13	1.60	0.2	4.7	0.3	0.2	
(M4.5)	0.75		10.6		2.8		6.9	4.7	2.53	1.99	0.2	5.2	0.35	0.25	
M5	0.8	3	11.8	0 -0.6	3.1	± 0.2	7.7	5.0	2.83	2.29	0.2	5.7	0.35	0.25	
M6	1		14		3.7		9.1	6.3	2.86	2.31	0.25	6.8	0.4	0.3	
M8	1.25		17.8		4.8		11.7	7.8	4.36	3.78	0.4	9.2	0.5	0.4	

- Remarks
1. In the Table, the designation of thread given in () should not preferably be used.
 2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.
 3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.
Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller than the maximum value of major diameter of the screw thread.
 4. The dimension x shall be approximately 2 threads.
 5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.

Annex Attached Table 5. Shape and dimensions of binding head screws



Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_k		k	f		$k+f$		m	$q^{(11)}$		r	d_a	$E^{(12)}$	$F^{(12)}$	G
			Basic size	Permissible deviation	Approx. size	Basic size	Permissible deviation	Basic size	Permissible deviation	Ref.	Max.	Min.	Min.	Max.	Max.	Max.	Max.
M2	0.4	1	4.3	0	0.85	0.35	± 0.1	1.2	± 0.15	2.2	1.01	0.65	0.1	2.6	0.15	0.1	2°
(M2.2)	0.45		4.7	-0.4	0.9	0.4		1.3		2.3	1.11	0.75	0.1	2.8	0.2	0.15	
M2.5	0.45		5.3		1	0.5		1.5		2.5	1.32	0.95	0.1	3.1	0.2	0.15	
M3	0.5	2	6.3	0	1.3	0.6		1.9		3.7	1.53	1.01	0.1	3.6	0.25	0.2	
(M3.5)	0.6		7.3	-0.5	1.5	0.7	± 0.15	2.2	± 0.2	4.0	1.83	1.30	0.1	4.1	0.25	0.2	
M4	0.7		8.3		1.7	0.8		2.5		4.3	2.13	1.60	0.2	4.7	0.3	0.2	
(M4.5)	0.75	3	9.3	0	1.9	0.9		2.8		4.7	2.53	1.99	0.2	5.2	0.35	0.25	
M5	0.8		10.3	-0.6	2.1	1		3.1		5.0	2.83	2.29	0.2	5.7	0.35	0.25	
M6	1		12.4	0	2.4	1.3		3.7		6.3	2.86	2.31	0.25	6.8	0.4	0.3	
M8	1.25		16.4	0	3.1	1.7	± 0.2	4.8	± 0.3	7.8	4.36	3.78	0.4	9.2	0.5	0.4	

Remarks 1. In the Table, the designation of thread given in () should not preferably be used.

2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.

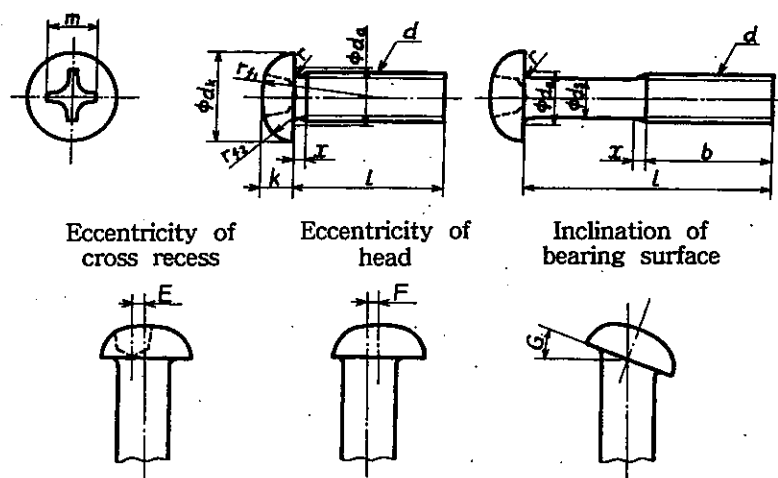
3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.

Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller than the maximum value of major diameter of the screw thread.

4. The dimension x shall be approximately 2 threads.

5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.

Annex Attached Table 6. Shape and dimensions of round head screws



Unit : mm

Designation of thread d	Pitch (P)	No. of cross recess	d_k		k		r_1	r_2	m	q ⁽¹⁾		r	d_a	E ⁽²⁾	F ⁽²⁾	G
			Basic size	Permissible deviation	Basic size	Permissible deviation	Approx.	Approx.	Ref.	Max.	Min.	Min.	Max.	Max.	Max.	Max.
M2	0.4	1	3.5	0 -0.4	1.3	± 0.1	2.1	1.2	2.1	0.91	0.50	0.1	2.6	0.15	0.1	2°
(M2.2)	0.45		4		1.5		2.4	1.3	2.3	1.11	0.70	0.1	2.8	0.2	0.15	
M2.5	0.45		4.5		1.7		2.7	1.5	2.5	1.32	0.90	0.1	3.1	0.2	0.15	
M3	0.5	2	5.5	0 -0.5	2	± 0.15	3.3	1.8	3.5	1.33	0.76	0.1	3.6	0.25	0.2	
(M3.5)	0.6		6		2.3		3.6	2	3.8	1.63	1.06	0.1	4.1	0.25	0.2	
M4	0.7		7		2.6		4.2	2.3	4.1	1.93	1.35	0.2	4.7	0.3	0.2	
(M4.5)	0.75		8	0 -0.6	3		4.8	2.7	4.5	2.33	1.74	0.2	5.2	0.35	0.25	
M5	0.8		9		3.4		5.4	3	4.8	2.63	2.04	0.2	5.7	0.35	0.25	
M6	1	3	10.5	0 -0.7	4	± 0.2	6.3	3.5	6.2	2.76	2.16	0.25	6.8	0.4	0.3	
M8	1.25		14		5.4		8.4	4.6	7.7	4.26	3.63	0.4	9.2	0.5	0.4	

- Remarks 1. In the Table, the designation of thread given in () should not preferably be used.
2. The nominal length (l) and thread length (b) shall be in accordance with Annex Attached Table 7.
3. The value of diameter (d_s) of unthreaded portion shall generally be approximately the pitch diameter of screw thread.
- Further, the value of d_s may be made approximately equal to the major diameter of screw thread, as required. In this case d_s shall be smaller than the maximum value of major diameter of the screw thread.
4. The dimension x shall be approximately 2 threads.
5. The shape of the screw end, unless designated, shall be as-rolled end, and when the chamfered end, flat point, etc. are required, the purchaser shall designate. However, the shape and dimensions of the screw end shall generally be in accordance with JIS B 1003.

Annex Attached Table 7. *l* and *b* of cross recessed head screws

Unit : mm

Designation of thread	M2	M2.2	M2.5	M3	M3.5	M4	M4.5	M5	M6	M8
<i>b</i>	8	10	12	12	14	16	20	20	25	30
<i>l</i>	4	○*	○*							
	5	○	○*	○*	○*	○*				
	6	○	○	○	○	○*	○*			
	8	○	○	○	○	○	○*	○*	○*	
	10	○	○	○	○	○	○	○	○*	○*
	12	○	○	○	○	○	○	○	○	○*
	14	○	○	○	○	○	○	○	○	○
	16	○	○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○
	25		○	○	○	○	○	○	○	○
	30		○	○	○	○	○	○	○	○
	35			○	○	○	○	○	○	○
	40			○	○	○	○	○	○	○
	45					○	○	○	○	○
	50					○	○	○	○	○
	55								○	○
	60								○	○

Remarks 1. In the frame of bold lines, the preferable nominal length (*l*) in respect to each designation of thread has been indicated, and those attached with *mark shall not be applied to the countersunk head screws and raised countersunk head screws.

Nominal length (*l*) other than those given in the above table may be used, as required, but in the case where the nominal length (*l*) exceeding 60 mm is required, it should preferably be in accordance with the following.

However, those given in () should not preferably be used as far as possible.

Unit : mm

65	70	75	80	85	90	(95)	100	(105)	110	(115)	120	(125)	130	140	150	160	170	180	190	200
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2. The permissible deviations on nominal length (*l*) shall be in accordance with the following table.

Unit : mm

Division of designation of thread Division of <i>l</i>	M2.5 or under	Over M2.5 to M4.5 or under	Over M4.5
4 or under	0 - 0.3	-	-
Over 4 to 10 or under	0 - 0.4	0 - 0.6	0 - 0.8
Over 10 to 20 or under	0 - 0.6	0 - 0.6	0 - 1
Over 20 to 40 or under	0 - 0.8	0 - 0.8	0 - 1
Over 40	-	0 - 1	0 - 1

3. The thread length (*b*) other than those given in the above table may be used according to agreement between the purchaser and the manufacturer.

4. The permissible deviations on thread length (*b*) shall be $\begin{matrix} +3P \\ 0 \end{matrix}$ unless specially designated, where *P* is the pitch of screw thread.

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