BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY

Doc No.: PGD 37 ()
IS 18471 : 2024

भारतीय मानक मसौदा

फास्टनर्स — टैपिंग स्क्रू थ्रेड के साथ क्रॉस रिसेस्ड ड्रिलिंग स्क्रू

Draft Indian Standard

Fasteners — Drilling Screws —- Specification

ICS 21.060.20

General Engineering and Fasteners Standards Sectional Committee, PGD 37

FOREWORD

(*Formal Clauses will be added later*)

The committee responsible for the formulation of this standard has decided to merge the following IS standards:

IS 18471 (Part 1) : 2023 Fasteners — Cross recessed drilling screws with tapping screw thread: Part 1 Pan head
IS 18471 (Part 2) : 2023 Fasteners — Cross recessed drilling screws with tapping screw thread: Part 2 Countersunk flat head
IS 18471 (Part 3) : 2023 Fasteners — Cross recessed drilling screws with tapping screw thread: Part 3 Raised countersunk oval head

Along with it, the requirements of other varieties of self-drilling screws like hexagon washer head, hexagon flange head, bugle head etc. have also been added.

Drilling screws play a pivotal role in seamlessly joining materials and structures. These versatile screws feature sharp points and finely crafted threads that enable them to effortlessly penetrate a variety of substrates, creating secure and reliable connections. Drilling screws are engineered to provide efficiency and convenience by eliminating the need for pre-drilled holes or separate tapping processes. Their ability to create threads as they are driven into materials like metal, wood, or plastic translates into time and cost savings across industries ranging from construction, where they secure metal roofing and wall panels, to manufacturing, where they streamline assembly lines and attach components. Cross recessed drilling screws feature a unique cross-shaped indentation on their head, which corresponds to a specialized screwdriver or bit. This design allows for easy and secure driving of the screw into the material.

Due to the diverse designs common in the industry, the standard specifies the dimensions of the most prevalent varieties of drilling screws. However, these dimensions are provided for reference only. The exact dimensions of the screws can be agreed upon between the user and the manufacturer.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard

FASTENERS — DRILLING SCREWS WITH TAPPING SCREW THREAD

1 SCOPE

This Indian Standard specifies the characteristics of drilling screws with tapping screw threads from ST2.9 up to and including ST6.3.

2 REFERENCES

IS No.	*Tittle*
IS 5957 : 2003/ ISO 1478 : 1999	Screw threads for thread forming tapping screws dimensions (*second revision*)
IS 1367 (Part 17) : 2023/ ISO 3269 : 2019	Technical supply conditions for threaded steel fasteners: Part 17 Inspections, sampling and acceptance procedure (*fifth revision*)
IS 1367 (Part 11) : 2020/ ISO 4042 : 2018	Technical supply conditions for threaded steel fasteners: Part 11 Electroplated coating systems (*fourth revision*)
IS 7478 : 2011/ ISO 4757 : 1983	Cross recesses for screws (*second revision*)
IS 1367 (Part 2) : 2002/ ISO 4759-1 : 2000	Technical supply conditions for threaded steel fasteners: Part 2 Tolerances for fasteners — Bolts, screws, studs and nuts — Product grades A, B and C (*third revision*)
ISO 10666 : 1999	Drilling screws with tapping screw thread — Mechanical and functional properties
IS 11362 : 1985/ ISO 7721 : 1983	Head configuration and gauging of countersunk head screws
IS 1367 (Part 1) : 2014/ ISO 8992 : 2005	Technical supply conditions for threaded steel fasteners: Part 1 General requirements for bolts, screws, studs and nuts (*fourth revision*)

3 DIMENSIONS

3.1 Unless otherwise agreed between the user/purchaser and the manufacturer, the dimensions of the drilling screws shall be as given in Table 1.

3.2 The dimensions and tolerances of self-drilling screws with the head shape other than those mentioned in Table 1 shall be agreed between the user and the manufacturer. However, the screws shall conform to the requirements mentioned in **6** and **9**.

3.3 For self-drilling screws with integrated/captive washers/sems screws (*see* Fig.1); the dimensions and other properties of the washer shall be mutually agreed upon between the user/purchaser and the manufacturer.

3.4 The dimensions of self-drilling screws which are partially threaded (*see* Fig.2) shall be agreed between the user/purchaser and the manufacturer. However, the screws shall conform to the requirements mentioned in **6** and **9**.

FIG. 1(B) WASHER HEAD WITH CAPTIVE WASHER

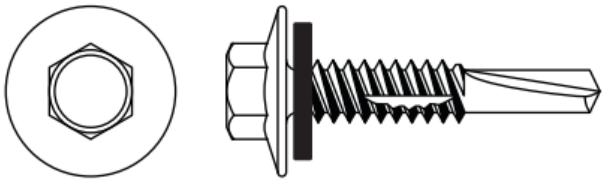


FIG. 1(B) FLANGE HEAD WITH CAPTIVE WASHER

FIG.1 DRILLING SCREWS WITH CAPTIVE WASHER

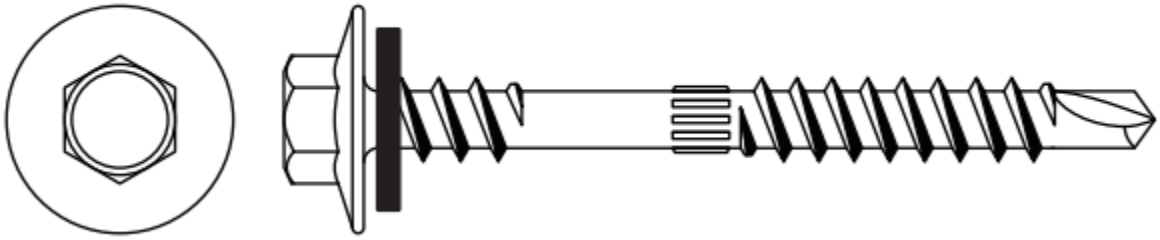


FIG.2 PARTIALLY THREADED FLANGE HEAD DRILLING SCREW WITH CAPTIVE WASHER

Table 1 Dimensions
(*Clause* 3.1)

Sl No.	Type of Screw	Dimensions
(1)	(2)	(3)
i)	Cross recessed pan head drilling screws	*see* Fig. 3 and Table 2
ii)	Cross recessed countersunk head drilling screws	*see* Fig. 3 and Table 3
iii)	Cross recessed raised countersunk head drilling screws	*see* Fig. 3 and Table 4
iv)	Cross recessed wafer head drilling screws	*see* Fig. 4, Table 5 and Table 6
v)	Cross recessed bugle head drilling screws	*see* Fig. 5 and Table 6
vi)	Hexagon socket bugle head drilling screws	*see* Fig. 5 and Table 7
vii)	Hexagon washer head drilling screws	*see* Fig. 6 and Table 8
viii)	Hexagon flange head drilling screws	*see* Fig. 7 and Table 9

4 GENERAL REQUIREMENTS

The general requirements of self-drilling screws shall be in accordance with IS 1367 (Part 1).

5 DRIVE

The dimensions of cross recess (wherever applicable) shall be in accordance with IS 7478.

6 MECHANICAL PROPERTIES

Self-drilling screws shall conform to all the requirements as specified in ISO 10666.

7 THREADS

Unless otherwise agreed between the user and the manufacturer, the dimensions of threads shall be in accordance with IS 5957.

8 TOLERANCES

Unless otherwise specified, self-tapping screws shall conform to product grade A in accordance with IS 1367 (Part 2).

9 CORROSION RESISTANCE

9.1 Classification

The corrosion resistance of self-drilling screws shall be classified by the corrosivity of the atmosphere of intended use and designated in accordance with the table given below:

Corrosion Resistance Class	*Atmosphere for Intended Use*
1	General use in internal applications
2	General use in other than external applications but where significant levels of condensation occurs
3	External use in moderate industrial or marine environments (C2 to C3)
4	External use in severe marine environments (C4)

9.2 Requirements for Corrosion Resistance

9.2.1 *Class* 1

When class 1 corrosion resistant self-drilling screws are tested in accordance with neutral salt spray test as specified in IS 5528 for 72 *h*, red rust shall not be present over more than 5 percent of the significant areas of the screw.

9.2.2 *Class* 2

When class 1 corrosion resistant self-drilling screws are tested in accordance with neutral salt spray test as specified in IS 5528 for 240 *h*, red rust shall not be present over more than 5 percent of the significant areas of the screw.

9.2.3 *Class* 3

When class 1 corrosion resistant self-drilling screws are tested in accordance with neutral salt spray test as specified in IS 5528 for 1000 *h*, red rust shall not be present over more than 5 percent of the significant areas of the screw.

9.2.4 *Class* 4

When class 1 corrosion resistant self-drilling screws are tested in accordance with neutral salt spray test as specified in IS 5528 for 2000 *h*, red rust shall not be present over more than 5 percent of the significant areas of the screw.

10 DESIGNATION

Self-tapping screws shall be designated by the thread size, nominal length, type of material, type of drive (wherever applicable) and type of thread end (wherever applicable).

Examples:

a) A cross-recessed pan head tapping screw with thread size ST 3.5, nominal length l = 16 mm, made of steel (St), rounded end (Type R) and cross recess Type Z is designated as follows:

Self-Drilling Screw IS 18481 — ST 3.5 × 16 — St — Z — R

b) A cross-recessed pan head tapping screw with thread size ST 3.5, nominal length l = 16 mm, made of stainless steel (A4-20H), rounded end (Type R) and cross recess Type H is designated as follows:

Tapping screw ISO 7049 — ST 3.5 × 16 — A4-20H — R — H

11 MARKING

11.1 The following shall be marked on the package:

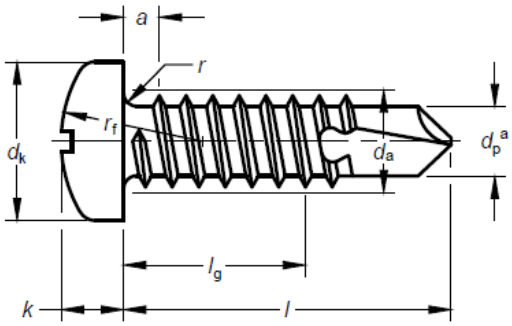
a) Designation;
b) Batch/lot number; and
c) Manufacturers initials

11.2 BIS Certification Marking

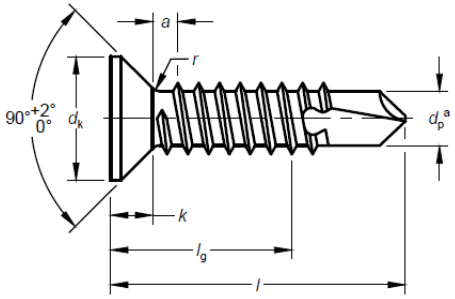
The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

12 SAMPLING AND ACCEPTANCE PROCEDURE

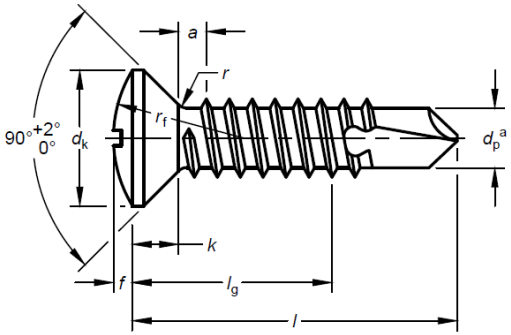
The sampling and acceptance procedure shall be in accordance with IS 1367 (Part 17).



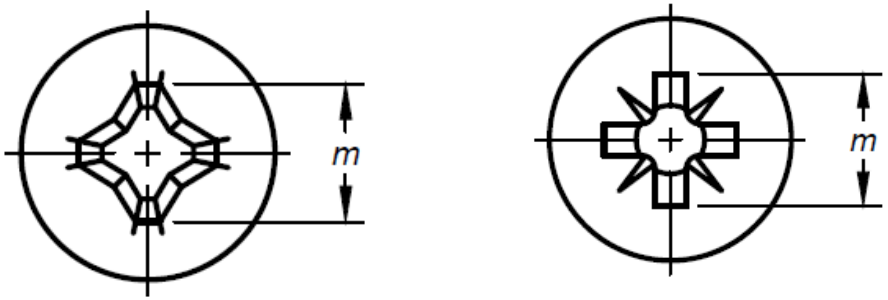
PAN HEAD



COUNTERSUNK HEAD



RAISED COUNTERSUNK HEAD



Cross Recess

FIG. 3 CROSS RECESSED DRILLING SCREWS (PAN HEAD, COUNTERSUNK HEAD AND RAISED COUNTERSUNK HEAD)

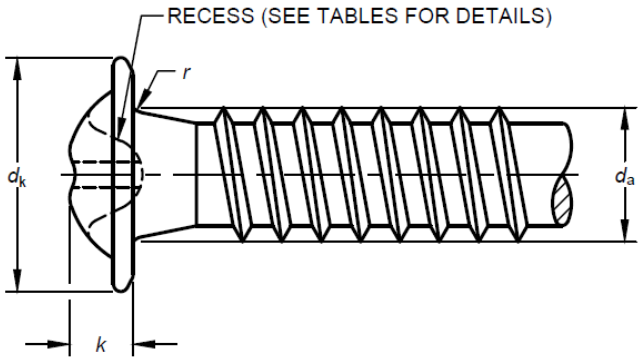


FIG. 4(A) WAFER HEAD (STYLE 1)

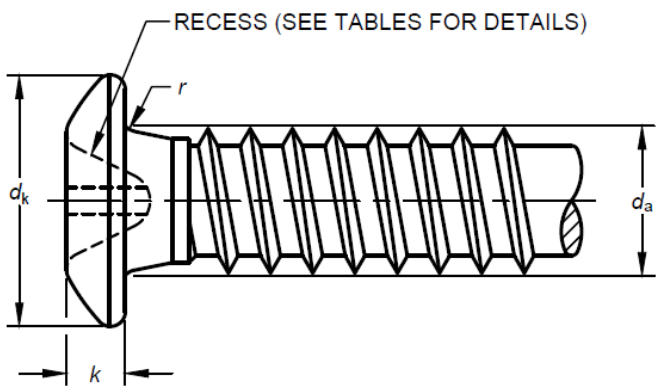


FIG. 4(B) WAFER HEAD (STYLE 2)

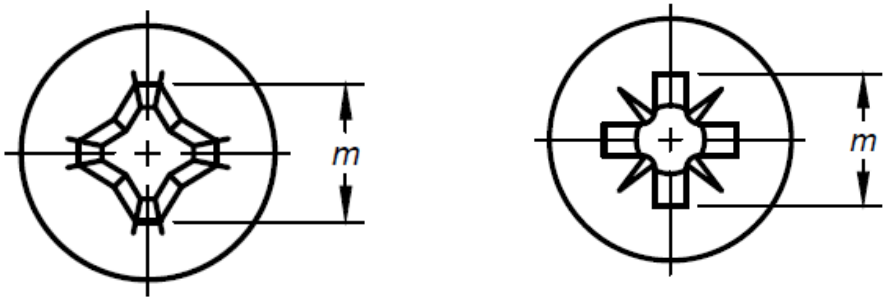


FIG. 4 CROSS RECESSED WAFER HEAD DRILLING SCREWS

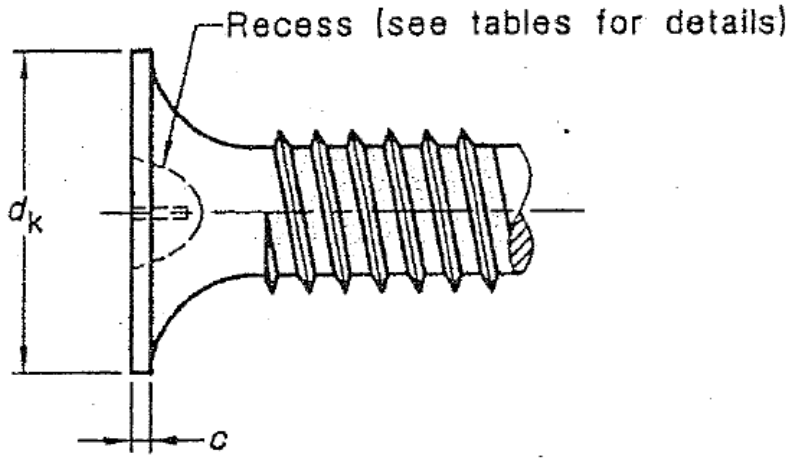


FIG. 5 CROSS RECESSED BUGLE HEAD

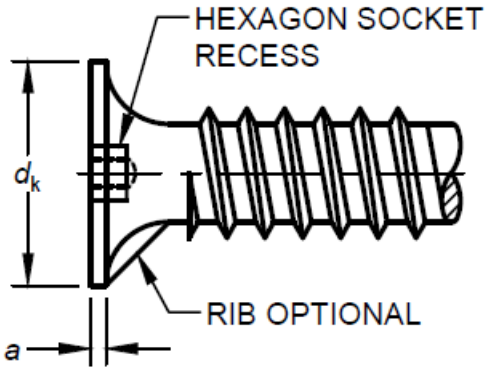


Fig. 5(B) HEXAGON SOCKET BUGLE HEADS (STYLE 1)

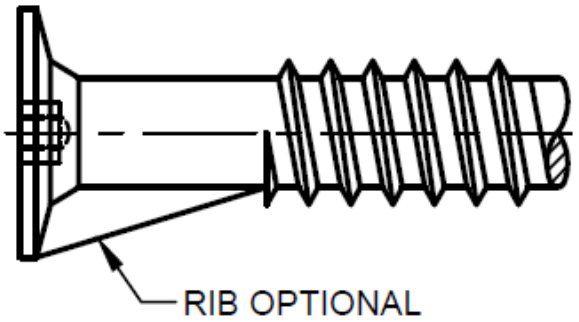


Fig. 5(B) HEXAGON SOCKET BUGLE HEADS (Style 2)

FIG. 5 CROSS RECESSED AND HEXAGON SOCKET BUGLE HEADS DRILLING SCREWS

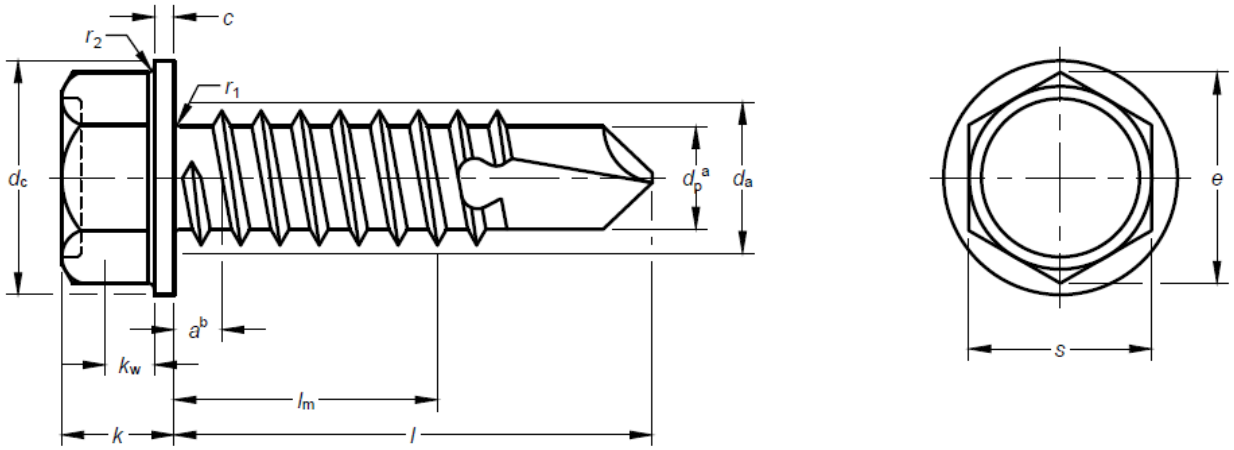


FIG. 6 HEXAGON WASHER HEAD DRILLING SCREW

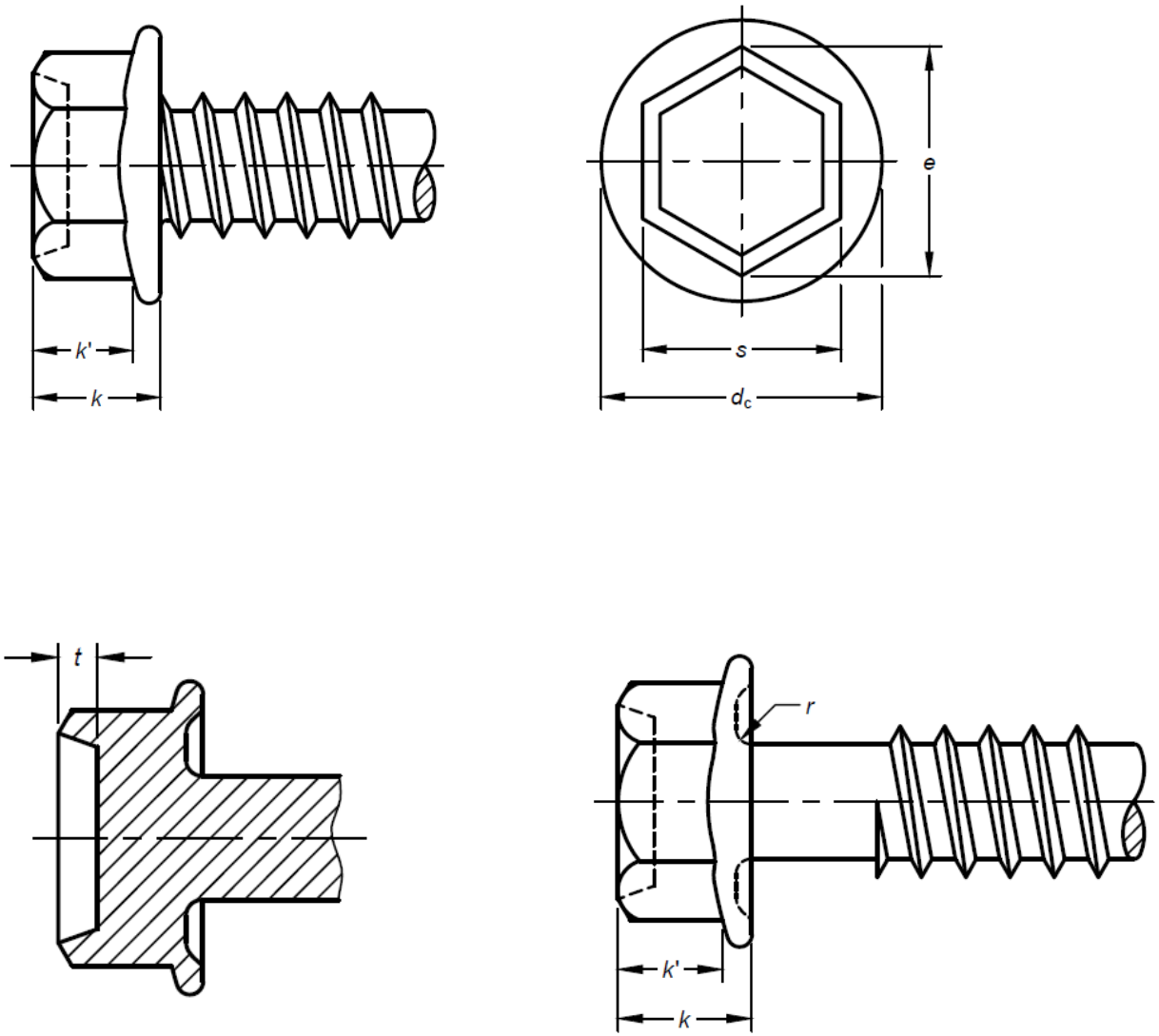


FIG. 7 HEXAGON FLANGE HEAD DRILLING SCREW

Table 2 Dimensions of Cross Recessed Pan Head Drilling Screws
(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Thread size			**ST2.9**	**ST3.5**	**ST4.2**	**ST4.8**	**ST5.5**	**ST6.3**
P[1)]			1.1	1.3	1.4	1.6	1.8	1.8
a[2)]	*Max*		1.1	1.3	1.4	1.6	1.8	1.8
d_a	*Max*		3.5	4.1	4.9	5.6	6.3	7.3
d_k	*Max*		5.6	7	8	9.5	11	12
	Min		5.3	6.64	7.64	9.14	10.57	11.57
k	*Max*		2.4	2.6	3.1	3.7	4	4.6
	Min		2.15	2.35	2.8	3.4	3.7	4.3
r	*Min*		0.1	0.1	0.2	0.2	0.25	0.25
r_f	≈		5	6	6.5	8	9	10
Cross recess	Recess No.		1	2			3	
	m ref.		3	3.9	4.4	4.9	6.4	6.9
	Type H Penetration *Max.*		1.8	1.9	2.4	2.9	3.1	3.6
	Min		1.4	1.4	1.9	2.4	2.6	3.1
	m ref.		3	4	4.4	4.8	6.2	6.8
	Type Z Penetration *Max.*		1.75	1.9	2.35	2.75	3	3.5
	Min		1.45	1.5	1.95	2.3	2.55	3.05
Drilling range (sheet or plate thickness)[3)]	from		0.7	0.7	1.75	1.75	1.75	2
	to		1.9	2.25	3	4.4	5.25	6
l[5)]			l_g[4)]					
Nom	*Min*	*Max*	*Min*					
9.5	8.75	10.25	3.25	2.85				
13	12.1	13.9	6.6	6.2	4.3	3.7		
16	15.1	16.9	9.6	9.2	7.3	5.8	5	
19	18	20	12.5	12.1	10.3	8.7	8	7
22	21	23	Lengths to be agreed between the purchaser and the manufacturer.	15.1	13.3	11.7	11	10
25	24	26		18.1	16.3	14.7	14	13
32	30.75	33.25			23	21.5	21	20
38	36.75	39.25			29	27.5	27	26
45	43.75	46.25				34.5	34	33
50	48.75	51.25				39.5	39	38

[1)]P is the pitch of the thread.
[2)]a is the distance from the underside of the head to the first major diameter of the thread.
[3)]In order to determine the nominal length *l*, it may be necessary to add an air gap (if present) to the individual sheet or plate thicknesses.

[4] l_g is the distance from the underside of the head to the last major diameter of the thread. For the lengths of drilling screws, l, greater than 50 mm, the tolerance shall be ± 1.25 mm and l_g shall be as agreed to between the user and the manufacturer.

[5] For lengths greater than 50 mm, the tolerance values shall be in accordance with product A as specified in Table 1 of IS 4206. For nominal lengths other than those specified in the table, the nearest value of length shall be taken to calculate tolerance.

Table 3 Dimensions of Cross Recessed Countersunk Head Drilling Screws

(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Thread size			**ST2.9**	**ST3.5**	**ST4.2**	**ST4.8**	**ST5.5**	**ST6.3**
P[1]			1.1	1.3	1.4	1.6	1.8	1.8
a[2]	*Max*		1.1	1.3	1.4	1.6	1.8	1.8
d_k	Theoretical[3]	*Max*	6.3	8.2	9.4	10.4	11.5	12.6
	Actual	*Max*	5.5	7.3	8.4	9.3	10.3	11.3
	Min		5.2	6.9	8	8.9	9.9	10.9
k	*Max*		1.7	2.35	2.6	2.8	3	3.15
r	*Max*		1.2	1.4	1.6	2	2.2	2.4
Cross recess	Recess No.		1	2			3	
	Type H	m refs	3.2	4.4	4.6	5.2	6.6	6.8
	Penetration	*Max*	2.1	2.4	2.6	3.2	3.3	3.5
	Min		1.7	1.9	2.1	2.7	2.8	3
	m ref.		3.2	4.3	4.6	5.1	6.5	6.8
	Type Z Penetration	*Max*	2	2.2	2.5	3.05	3.2	3.45
	Min		1.6	1.75	2.05	2.6	2.75	3
Drilling range (sheet or plate thickness)[4]	from		0.7	0.7	1.75	1.75	1.75	2
	to		1.9	2.25	3	4.4	5.25	6
l[6]			l_g[5]					
Nom	Min	Max	*Min*					
13	12.1	13.9	6.6	6.2	4.3	3.7		
16	15.1	16.9	9.6	9.2	7.3	5.8	5	
19	18	20	12.5	12.1	10.3	8.7	8	7
22	21	23	Lengths to be agreed between the purchaser and the manufacturer.	15.1	13.3	11.7	11	10
25	24	26		18.1	16.3	14.7	14	13
32	30.75	33.25			23	21.5	21	20
38	36.75	39.25			29	27.5	27	26
45	43.75	46.25				34.5	34	33
50	48.75	51.25				39.5	39	38

[1)]P is the pitch of the thread
[2)]a is the distance from the underside of the head to the first major diameter of the thread.
[3)]*See* IS 11362.
[4)]In order to determine the nominal length *l* it may be necessary to add an air gap (if present) to the individual sheet or plate thicknesses.
[5)]*l*g is the distance from the underside of the head to the last major diameter of the thread. For the lengths of drilling screws, *l*, greater than 50 mm, the tolerance shall be ± 1.25 mm and l_g shall be as agreed to between the user and the manufacturer.
[6)]For lengths greater than 50 mm, the tolerance values shall be in accordance with product A as specified in Table 1 of IS 4206. For nominal lengths other than those specified in the table, the nearest value of length shall be taken to calculate tolerance.

Table 4 Dimensions of Cross Recessed Raised Countersunk Head Drilling Screws
(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Thread size			**ST2.9**	**ST3.5**	**ST4.2**	**ST4.8**	**ST5.5**	**ST6.3**
P[1)]			1.1	1.3	1.4	1.6	1.8	1.8
a[2)]	*Max*		1.1	1.3	1.4	1.6	1.8	1.8
d_k	Theoretical[3)]	*Max*	6.3	8.2	9.4	10.4	11.5	12.6
	actual	*Max*	5.5	7.3	8.4	9.3	10.3	11.3
	Min		5.2	6.9	8	8.9	9.9	10.9
f	≈		0.7	0.8	1	1.2	1.3	1.4
k	*Max*		1.7	2.35	2.6	2.8	3	3.15
r	*Max*		1.2	1.4	1.6	2	2.2	2.4
Cross recess	Recess No.		1	2			3	
	Type H	m ref.	3.2	4.4	4.6	5.2	6.6	6.8
	Penetration	*Max*	2.1	2.4	2.6	3.2	3.3	3.5
	Min		1.7	1.9	2.1	2.7	2.8	3
	m ref.		3.2	4.3	4.6	5.1	6.5	6.8
	Type Z Penetration	*Max*	2	2.2	2.5	3.05	3.2	3.45
	Min		1.6	1.75	2.05	2.6	2.75	3
Drilling range (sheet or plate thickness)[4)]	from		0.7	0.7	1.75	1.75	1.75	2
	to		1.9	2.25	3	4.4	5.25	6
l[6)]			l_g[5)]					
Nom	Min	Max	Min					
13	12.1	13.9	6.6	6.2	4.3	3.7		
16	15.1	16.9	9.6	9.2	7.3	5.8	5	
19	18	20	12.5	12.1	10.3	8.7	8	7
22	21	23		15.1	13.3	11.7	11	10
25	24	26		18.1	16.3	14.7	14	13

32	30.75	33.25	Lengths to be agreed between the purchaser and the manufacturer.	23	21.5	21	20
38	36.75	39.25		29	27.5	27	26
45	43.75	46.25			34.5	34	33
50	48.75	51.25			39.5	39	38

[1] *p* is the pitch of the thread

[2] *a* is the distance from the underside of the head to the first major diameter of the thread.

[3] *See* IS 11362.

[4] In order to determine the nominal length l it may be necessary to add an air gap (if present) to the individual sheet or plate thicknesses.

[5] *l*g is the distance from the underside of the head to the last major diameter of the thread. For the lengths of drilling screws, *l*, greater than 50 mm, the tolerance shall be ± 1.25 mm and l_g shall be as agreed to between the user and the manufacturer.

[6] For lengths greater than 50 mm, the tolerance values shall be in accordance with product A as specified in Table 1 of IS 4206. For nominal lengths other than those specified in the table, the nearest value of length shall be taken to calculate tolerance.

Table 5 Dimensions of Cross Recessed Wafer Head Drilling Screws (Style 1)

(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Size designation			ST3.5	ST4.2	ST4.8
P[a]					
Head dia. (d_k)	*Min*		6.73	7.77	8.94
	Max		6.86	8.18	9.53
Taper dia. (d_a)	*Min*		4.06	4.57	4.83
	Max		4.32	4.83	5.21
Head height (*k*)	*Min*		1.39	1.65	1.52
	Max		1.65	1.90	2.03
(r)	*Min*		0.25	0.25	0.38
	Max		0.51	0.51	0.89
Cross recess			2		
	Type H Penetration	*Min*	1.27	1.27	1.90
		Max	1.88	1.90	2.67
	Min				

Table 6 Dimensions of Cross Recessed Wafer Head Drilling Screws (Style 2)
(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Size designation			ST4.8
P[a]			
Head dia. (d_k)	*Min*		9.07
	Max		9.47
Taper dia. (d_a)	*Min*		4.83
	Max		5.26
Head height (*k*)	*Min*		1.65
	Max		1.91
(r)	*Min*		0.38
	Max		0.89
Cross recess	2		
	Type H Penetration	*Min*	2.13
		Max	2.74

Table 7 Dimensions of Cross Recessed Bugle Head Drilling Screws (Style 1)
(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Size Designation	Head Diameter d_k *Min*	Head Edge Thickness (*c*)		Cross Recess No.	Cross Recess Penetration Value	
		Min	*Max*		*Min*	*Max*
ST 3.5	7.90	0.46	0.81	Type H No. 2	2.59	3.17
ST 3.9	7.90	0.46	0.81	Type H No. 2	2.59	3.17
ST 4.2	7.90	0.46	0.81	Type H No. 2	2.26	3.17

Table 8 Dimensions of Hexagon Socket Bugle Head Drilling Screws
(*Clause* 3.1 *and* Table 1)

All dimension are in millimetres.

Size Designation	Head Diameter d_k	
	Min	*Max*
ST 6.3	13.59	14.61

Table 9 Dimensions of Hexagon Washer Head Drilling Screws

All dimension are in millimetres.

Thread size			ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
P[1]			1.1	1.3	1.4	1.6	1.8	1.8
a	*Max*		1.1	1.3	1.4	1.6	1.8	1.8
c	*Min*		.4	.6	.8	.9	1.0	1.0
d_a	*Max*		3.5	4.1	4.9	5.6	6.3	7.3
d_c	*Max*		6.3	8.3	8.8	10.5	11	13.5
	Min		5.8	7.6	8.1	9.8	10	12.2
e	*Min*		4.28	5.96	7.59	8.71	8.71	10.95
k	*Max*		2.8	3.4	4.1	4.3	5.4	5.9
	Min		2.5	3.0	3.6	3.8	4.8	5.3
k_w[2)]	*Min*		1.3	1.5	1.8	2.2	2.7	3.1
r_1	*Min*		0.1	0.1	0.2	0.2	0.25	0.25
r_2	*Max*		0.2	0.25	0.3	0.3	0.4	0.5
s	*Max*		4.0[3)]	5.50	7.00	8.00	8.00	10.00
	Min		3.82	5.32	6.78	7.78	7.78	9.78
	Min		1.45	1.5	1.95	2.3	2.55	3.05
Drilling range (sheet or plate thickness)[4)]	from		0.7	0.7	1.75	1.75	1.75	2
	to		1.9	2.25	3	4.4	5.25	6
l[6)]			L_m[5)]					
Nom	*Min*	*Max*	Min					
9.5	8.75	10.25	3.25	2.85			Screws with too short lengths	
13	12.1	13.9	6.6	6.2	4.3	3.7		
16	15.1	16.9	9.6	9.2	7.3	5.8	5	
19	18	20	12.5	12.1	10.3	8.7	8	7
22	21	23	Length to be agreed between the purchaser and the manufacturer	15.1	13.3	11.7	11	10
25	24	26		18.1	16.3	14.7	14	13
32	30.75	33.25			23	21.5	21	20
38	36.75	39.25			29	27.5	27	26
45	43.75	46.25				34.5	34	33
50	48.75	51.25				39.5	39	38

Hexagon head with separate washer is also permitted. In that case, the washer outside dimeter shall conform to the dimension d_c.

[1)]p is the of the thread.

[2)]k_w is the wrenching height.

[3)]Divergence from the width across flats for hexagon tapping screws in accordance with ISO 1479(5mm). In the case of hexagon washer head tapping screws (see ISO 7053)**,** the width across flats of 4mm has been introduced worldwide and also applies in this case.

[4)]In order to determine the nominal length *l* needed for the application, it can be necessary to add an air gap (if present) to the individual sheet or plate thickness(es).

[5)]l_m is the distance from the bearing face to the last major diameter of the thread.

[6)]For lengths greater than 50 mm, the tolerance values shall be in accordance with product A as specified in Table 1 of IS 4206. For nominal lengths other than those specified in the table, the nearest value of length shall be taken to calculate tolerance.

Table 10 Dimensions of Hexagon Washer Head Drilling Screws

All dimension are in millimetres.

Size Designation	**Width Across Flats (*s*)**		**Washer Dia. (d_e)**		**Across corners (min.) (*e*)**	**Wrenching Height (*k'*)**		**Head Height (*k*)**		**Indent Depth (max.) (*t*)**	**Fillet Radius (min.) (*r*)**
	Min	*Max*	*Min*	*Max*		*Min*	*Max*	*Min*	*Max*		
ST 3.5 (No. 6)	6.20	6.35	8.38	9.14	6.91	1.90	2.29	3.05	3.43	1.14	0.25
ST 4.2 (No. 8)	6.20	6.35	9.40	10.29	6.91	2.41	2.79	3.68	4.32	1.14	0.38
ST 4.8 (No. 10)	7.78	7.92	10.67	11.43	8.64	2.79	3.30	4.32	4.83	1.40	0.38
ST 5.5 (No. 12)	7.78	7.92	13.97	14.78	8.64	3.61	3.94	5.08	5.92	1.65	0.51
ST 6.3 (No. 14)	9.32	9.52	13.97	15.49	10.39	4.06	4.70	5.84	6.60	1.91	0.76