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भारतीय मानक

Indian Standard

IS 18509 : 2024

लकड़ी हेतु क्रॉस रिसेस्ड काउंटरसंक हेड पेंच — विशिष्टि

Cross Recessed Countersunk Head Wood Screws — Specification

ICS 21.060.10

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General Engineering and Fasteners Standards Sectional Committee, PGD 37

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the General Engineering and Fasteners Standards Sectional Committee had been approved by the Production and General Engineering Division Council.

Cross recessed countersunk head wood screws are extensively used in wood working projects. They provide a strong and reliable connection between wooden pieces, making them ideal for constructing furniture, cabinets, shelves, and other wooden structures. Carpenters often use these screws to join wooden parts in carpentry work. Whether it's framing, installing doors and windows, or building wooden stairs, these screws are essential for creating sturdy and long lasting connections. This standard provides the industry with relevant quality parameters to manufacture cross recessed counter sunk head wood screws as per internationally accepted norms.

In the preparation of this standard, assistance has been taken from DIN 7997 : 2016 ‘Cross recessed countersunk head wood screws’.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

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.

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Indian Standard

CROSS RECESSED COUNTERSUNK HEAD WOOD SCREWS — SPECIFICATION

1 SCOPE

This standard specifies the characteristics of cross recessed countersunk head wood screws for thread diameter from 2 mm to 8 mm.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 SYMBOLS

For the purpose of this standard, the symbols given in IS 8535 shall apply.

4 DIMENSIONS

The dimensions of cross recessed countersunk head wood screws shall be as given in Fig 1, Table 1 and Table 2.

5 REQUIREMENTS

The various requirements of cross recessed countersunk wood screws shall be as given in Table 3 and Table 4.

6 TORQUE TESTING

The screws shall conform to the minimum breaking torque requirements as mentioned in Table 5 when tested in accordance with IS 1367 (Part 20).

7 HARDNESS

7.1 Cross recessed countersunk head wood screws shall have a minimum surface hardness of 450 HV 0.3 when measured in accordance with IS 1501 (Part 1).

The total case depth for various diameter shall be as mentioned in the table below:

Sl No.	*Diameter*	*Total Case Depth* *mm*
(1)	(2)	(3)
i)	$d \leq 3.5$	0.1 to 0.18
ii)	$3.5 < d \leq 5$	0.1 to 0.23
iii)	$5 < d \leq 6$	0.14 to 0.30
iv)	$6 < d \leq 8$	0.14 to 0.5

7.2 Cross recessed countersunk head wood screws shall have core hardness of 300 HV 0.1 to 450 HV 0.1 when measured in accordance with IS 1501 (Part 1).

8 DESIGNATION

Cross recessed countersunk head wood screws shall be designated by the name, IS number of this standard, thread size, length *l* (Nominal size), material (Grade of steel/SS or Brass), and type of cross slot.

Example:

A cross recessed countersunk head wood screw with thread size 4 mm, length 20 mm, made up of steel and with type H cross recess shall be designated as:

Wood screw: IS 18509 – 4 × 20 — Steel(7M) – H

9 MARKING

9.1 Each package shall be legibly marked with the following information:

a) Designation and type of coating;
b) Manufacturer's name/initials or trademark; and

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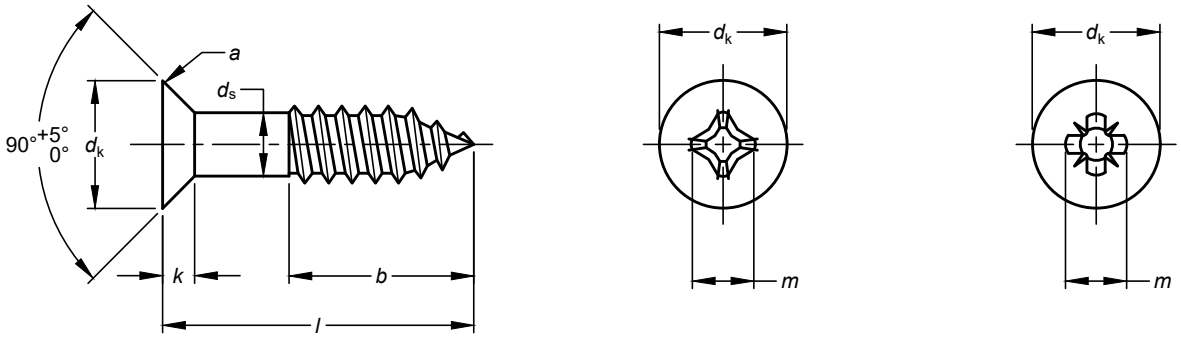
c) Month and year of manufacture or batch/lot number.

9.2 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 product(s) may be marked with the Standard Mark.



[a] Edge rounded and flat

$b \geq 0.6\ l$

Longitudinal view

Head view, cross recess Type H

Head view, cross recess Type Z

FIG. 1 DIMENSIONS OF COUNTERSUNK HEAD WOOD SCREW

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Table 1 Dimensions

(*Clause* 4)

All dimensions are in millimetres.

Sl No.	**Thread Size**				**(2)**	**2.5**	**3**	**3.5**	**4**	**4.5**	**5**	**(5.5)**	**6**	**(7)**	**(8)**
(1)	(2)				(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	d_s	*Max* = Nominal dimensions			2	2.5	3	3.5	4	4.5	5	5.5	6	7	8
		Min			1.6	2.1	2.6	3.02	3.52	4.02	4.52	5.02	5.52	6.42	7.42
ii)	d_k	Nominal size			3.8	4.7	5.6	6.5	7.5	8.3	9.2	10.2	11	12.5	14.5
		Max			4.18	5.08	5.98	6.95	7.95	8.75	9.65	10.75	11.55	13.05	15.05
		Min			3.42	4.32	5.22	6.05	7.05	7.85	8.75	9.65	10.45	11.95	13.95
iii)	*k*	*Max*			1.2	1.5	1.65	1.93	2.2	2.35	2.5	2.75	3	3.5	4
	Cross recess No.				0	1		2				3			4
iv)	Cross recess	Type H	*m*	≈	—	2.7	2.9	3.9	4.4	4.6	4.8	6.2	6.6	6.8	8.7
			Penetration depth	*Min*	—	1.25	1.5	1.4	1.9	2.1	2.29	2.31	2.8	2.95	3.9
				Max	—	1.55	1.8	1.9	2.4	2.6	2.79	2.81	3.3	3.53	4.4
		Type Z	*m*	≈	—	2.8	3	4	4.2	4.4	5	6.1	6.3	7	8.5
			Penetration depth	*Min*	—	1.48	1.76	1.6	1.85	2.05	2.64	2.46	2.72	3.38	3.86
				Max	—	1.73	2.01	2.06	2.31	2.51	3.1	2.92	3.18	3.84	4.32
NOTE — Bracketed sizes should be avoided as far as possible.															

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Table 2 Permissible Lengths and Tolerances

(*Clause* 4)

Sl No.	Nominal length *l*	***Min***	***Max***
(1)	(2)	(3)	(4)
i)	10	9.25	10.75
ii)	12	11.1	12.9
iii)	(14)	13.1	14.9
iv)	16	15.1	16.9
v)	(18)	17.1	18.9
vi)	20	19	21
vii)	25	24	26
viii)	30	29	31
ix)	35	33.75	36.25
x)	40	38.75	41.25
xi)	45	43.75	46.25
xii)	50	48.75	51.25
xiii)	60	58.5	61.5
xiv)	70	68.5	71.5
xv)	80	78.5	81.5

NOTES
1 Lengths over 80 mm shall be incremented in steps of 10 mm.
2 Bracketed sizes should be avoided as far as possible.

Table 3 Requirements

(*Clause* 5)

Sl No.	Material		Steel	Stainless Steel	Non-ferrous Metal
(1)	(2)		(3)	(4)	(5)
i)	General requirements		IS 1367 (Part 1)		
ii)	Thread and screw ends		*see* Table 4		
iii)	Cross recess		Cross recess in accordance with IS 7478		
iv)	Material		Grade 7M or 8M conforming to IS 7887	Grades A2, A3, A4 or A5 conforming to IS 1367 (Part 14/Sec 4)	Brass[1)]
v)	Tolerances, shape and positional tolerances	Product grade	C confirming to IS 1367 (Part 2)[2)]		

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Table 3(*Concluded*)

Sl No.	Material	Steel	Stainless Steel	Non-ferrous Metal
(1)	(2)	(3)	(4)	(5)
vi)	Surface Coating	As processed (no coating) Electroplating shall be done in accordance with IS 1367 (Part 11) Phosphating shall be done in accordance with IS 1367 (Part 12) Additional requirements or other finishes or coatings shall be agreed between the supplier and the purchaser	Clean and bright and/or passivated	As processed (no coating) Electroplating shall be done in accordance with IS 1367 (Part 11)
vii)	Surface condition	The limits of surface defects shall be in accordance with IS 1367 (Part 9/Sec 1)		
viii)	Acceptance test	Requirements of IS 1367 (Part 17) shall apply to the acceptance test		

[1)]The specific grade of material shall be in agreement between the manufacturer and purchaser

[2)]IS 1367 (Part 2) currently only applies to screws with metric ISO threads and self-tapping screws. The permissible deviations and tolerances for shape and position for these screws are to be adopted for wood screws unless they are specified in this standard

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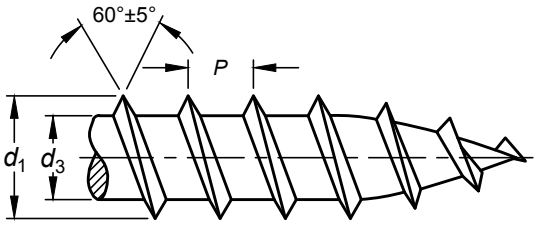
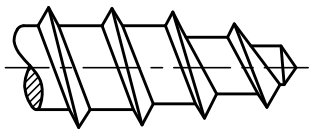
Table 4 Permissible Deviations on Thread

(*Clause* 5)

All dimensions are in millimetres.



Form of the thread end shall be at manufacturer's choice



Sl No.	d_1[1)]	d_3[1)]	*P*	
	h15	h15	Nominal	Permissible Deviation
(1)	(2)	(3)	(4)	(5)
i)	1.6	1.1	0.7	± 0.07
ii)	2	1.4	0.9	± 0.09
iii)	2.5	1.7	1.1	± 0.11
iv)	3	2.1	1.35	± 0.14
v)	3.5	2.4	1.6	± 0.16
vi)	4	2.8	1.8	± 0.18
vii)	4.5	3.1	2	± 0.20
viii)	5	3.5	2.2	± 0.22
ix)	5.5	3.8	2.4	± 0.24
x)	6	4.2	2.6	± 0.26
xi)	7	4.9	3.2	± 0.32
xii)	8	5.6	3.6	± 0.36

[1)]The tolerances on d_1 and d_3 shall be h15 [*see* IS 919 (Part 2)].

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Table 5 Breaking Torque Requirements

(*Clause* 6)

Sl No.	Thread Size	Torque (N/m) *Min*
(1)	(2)	(3)
i)	2	1.2
ii)	2.5	1.8
iii)	3	2.2
iv)	3.5	2.8
v)	4	3.2
vi)	4.5	4.3
vii)	5	5.8
viii)	5.5	7.8
ix)	6	10.2
x)	7	14.4
xi)	8	16.2

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ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Tittle*
IS 919 (Part 2) : 2014/ ISO 286-2 : 2010	Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes: Part 2 Tables of standard tolerance classes and limit deviation for holes and shafts (*second revision*)
IS 1367	Technical supply conditions for threaded steel fasteners:
(Part 1) : 2014/ ISO 8992 : 2005	Part 1 General requirements for bolts, screws, studs and nuts (*fourth revision*)
(Part 2) : 2002/ ISO 4759-1 : 2000	Part 2 Tolerances for fasteners — Bolts, screws, studs and nuts — Product grades A, B and C (*third revision*)
(Part 9/Sec 1) : 1993/ISO 6157-1 : 1988	Part 9 Surface discontinuities, Section 1 Bolts, screws and studs for general applications (*third revision*)
(Part 11) : 2020/ ISO 4042 : 2018	Part 11 Electroplated coating systems (*fourth revision*)
(Part 12) : 1981	Part 12 Phosphate coatings on threaded fasteners (*second revision*)
(Part 14/Sec 4) : 2023/ISO 3506-4 : 2009	Part 14 Mechanical properties of corrosion-resistant stainless-steel fasteners, Section 4 Tapping screws
(Part 17) : 2023/ ISO 3269 : 2019	Part 17 Inspections, sampling and acceptance procedure (*fifth revision*)
(Part 20) : 1996/ISO 898-7 : 1992	Mechanical properties: Part 20 Torsional — Test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm
IS 1501 (Part 1) : 2020/ ISO 6507-1 : 2018	Metallic materials — Vickers hardness test: Part 1 Test method (*fifth revision*)
IS 7478 : 2011/ISO 4757 : 1983	Cross recesses for screws (*second revision)*
IS 7887 : 1992	Mild steel wire rod for general engineering purposes — Specification (*first revision*)
IS 8535 : 2020/ISO 1891 : 2009	Fasteners — Terminology (*second revision*)

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ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

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Amendments Issued Since Publication

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