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Indian Standard

SPECIFICATION FOR MILD STEEL AND BRASS CUP, RULER AND SQUARE HOOKS AND SCREW EYES

(Revised)

(Incorporating Amendment Nos. 1 & 2)

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BUREAU OF INDIAN STANDARDS MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG NEW DELHI 110002

Price Group 4

Indian Standard

SPECIFICATION FOR MILD STEEL AND BRASS CUP, RULER AND SQUARE HOOKS AND SCREW EYES

(Revised)

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Indian Standard

SPECIFICATION FOR MILD STEEL AND BRASS CUP, RULER AND SQUARE HOOKS AND SCREW EYES

(Revised)

O. FOREWORD

- **0.1** This revised Indian Standard was adopted by the Indian Standards Institution on 10 March 1964, after the draft finalized by the Builder's Hardware Sectional Committee had been approved by the Building Division Council.
- **0.2** This standard was first issued in 1956 specifying the various dimensions and other requirements of cup, ruler and square hooks and screw eyes in the fps system. In view of the adoption of the metric system of weights and measures by the Government of India, the need for revision of this standard with a view to metricizing it and bringing it in line with IS: 451-1961 Specification for Wood Screws (*Revised*) in regard to form of screw thread and other relevant requirements, has long been felt by both the trade and consumers. This revision, therefore, specifies the various dimensions and other requirements of hooks and eyes made of mild steel and brass in the metric units, and the details of screw threads and other relevant requirements in accordance with IS: 451-1961.
- **0.3** The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of producers, consumers and technologists and has related the standard to the manufacturing and trade practices followed in the country in this field. Due weightage has also been given to the need for international co-ordination among standards prevailing in different countries of the world.
- **0.4** Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to its latest version.
- **0.5** This edition 2.2 incorporates Amendment No. 2 (January 1988). Side bar indicates modification of the text as the result of incorporation of the amendment.
- **0.6** 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: 2-1960 Rules for Rounding Off Numerical Values (*Revised*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

0.6 This standard is intended chiefly to cover the technical provisions relating to cup, ruler and square hooks and screw eyes, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard lays down requirements for mild steel and brass cup, ruler and square hooks and screw eyes.

2. TYPES

- **2.1** Hooks shall be of the following types:
 - a) Shouldered cup hooks (see Fig. 1)
 - b) Shouldered ruler hooks (see Fig. 2)
 - c) Shouldered square hooks (see Fig. 3)
 - d) Plain cup hooks (see Fig. 4)
 - e) Plain ruler hooks (see Fig. 5)
 - f) Plain square hooks (see Fig. 6)
- **2.2** Screw eyes shall be of one type as illustrated in Fig. 7.

3. DESIGNATION

3.1 The designation of hooks and screw eyes covered by this standard shall be based on the type, length, and screw designation No. of the fitting as indicated in the following examples:

Example	Description	Designation
1	Shouldered cup hook of length 25 mm and of screw designation No. 5	Shouldered Cup Hook 25 × No. 5
2	Shouldered ruler hook of length 25 mm and of screw designation No. 5	Shouldered Ruler Hook 25 × No. 5
3	Shouldered square hook of length 25 mm and of screw designation No. 5	Shouldered Square Hook 25 × No. 5

Example	Description	Designation
4	Plain cup hook of length 25 mm and of screw designation No. 5	$\begin{array}{ccc} Plain & Cup & Hook \\ 25 \times No. \ 5 \end{array}$
5	Plain ruler hook of 25 mm length and of screw designation No. 5	Plain Ruler Hook 25 × No. 5
6	Plain square hook of 25 mm length and of screw designation No. 5	Plain Square Hook 25 × No. 5
7	Screw eye of 25 mm length and of screw designation No. 4	Eye $25 \times No. 4$

4. MATERIAL

4.1 Mild Steel Wire — Mild steel wire used in the manufacture of hooks and eyes shall conform to IS: 1812-1982 'Specification for carbon steel wire for the manufacture of wood screws (*second revision*)'.

4.2 Brass Wire

4.2.1 Brass wire used in the manufacture of brass hooks and eyes shall have the following chemical composition when tested in accordance with IS: 3685-1966 Methods of chemical analysis of brasses:

Constituent	Percent
Copper	60 to 72
Zinc	28 to 40
Tin, Max	0.05
Iron, Max	0.1
Lead, Max	0.1
Total impurities including tin,	
iron, lead, etc, Max	0.8

4.2.2 Brass wire shall have a minimum ultimate tensile strength of 425 MPa and a minimum elongation at break of 15 percent, when tested in accordance with IS: 2656-1964 'Method for tensile testing of copper and copper alloy wire'.

5. MANUFACTURE

- **5.1** Hooks and eyes shall be well made and free from defects. They shall be finished to the required shape and dimensions so as to function properly when in use.
- **5.2** The screw thread and the gimlet point of hooks and eyes shall conform to the requirements laid down in IS: 451-1972 Technical supply conditions for wood screws (*second revision*)'.

6. DIMENSIONS AND TOLERANCES

- **6.1** The dimensions of hooks shall conform to the respective requirements laid down in Fig. 1 to 6 and Tables I to IV.
- **6.2** The dimensions of screw eyes shall conform to the requirements laid down in Fig. 7 and Table V.

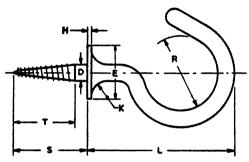


FIG. 1 SHOULDERED CUP HOOK

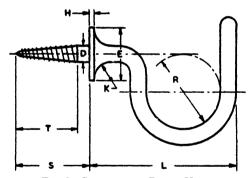


FIG. 2 SHOULDERED RULER HOOK

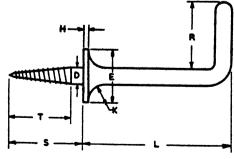


FIG. 3 SHOULDERED SQUARE HOOK

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TABLE I DIMENSIONS OF SHOULDERED CUP AND RULER HOOKS

(Clause 6.1 and Fig. 1 and 2)

All dimensions in millimetres.

	DESIGNATION	LENGTH	SCREW DESIG- NATION No.	Nominal Dia of Unthrea- ded Shank	DIA OF SHOULDER	WIDTH OF SHOULDER	RADIUS BEHIND SHOULDER	DIA OF HOOK	TOTAL LENGTH OF SHANK	THREADED LENGTH OF SHANK
		L		D	E	Н	K	R	S	T
	15 × No. 3	$15.0^{+0.5}_{-0}$	3	2.39	$5.7^{+0.5}_{-0}$	0.6	2.0	$6.5^{+0.5}_{-0}$	$7.0^{+0.4}_{-0}$	$4.7^{+0.4}_{-0}$
1	20 × No. 4	$20.0^{+0.5}_{-0}$	4	2.74	$6.5^{+0.5}_{-0}$	0.7	2.2	$10.0^{+0.5}_{-0}$	$9.0^{+0.4}_{-0}$	$6.5^{+0.4}_{-0}$
	$25 \times No. 5$	$25.0^{+0.5}_{-0}$	5	3.10	$7.5^{+0.5}_{-0}$	0.8	2.5	$13.0^{+0.5}_{-0}$	$11.0^{+0.4}_{-0}$	$8.0^{+0.4}_{-0}$
	$35 \times No. 7$	35 + 1 - 0	7	3.81	$9.7^{+0.5}_{-0}$	1.0	3.2	$19.0^{+0.5}_{-0}$	$16.0^{+0.4}_{-0}$	$12.5^{+0.4}_{-0}$
	$40 \times No. 8$	40 + 1 - 0	8	4.17	$10.0^{+0.5}_{-0}$	1.1	3.5	$22.0^{+0.5}_{-0}$	$18.0^{+0.4}_{-0}$	$14.0^{+0.4}_{-0}$
	50 × No. 10	50 + 1 - 0	10	4.88	$10.8^{+0.5}_{-0}$	1.2	4.0	28.5 ^{+ 0.5} _{- 0}	$22.0^{+0.4}_{-0}$	$17.5^{+0.4}_{-0}$
	50 × No. 12	50 + 1 - 0	50	5.59	$11.5^{+0.5}_{-0}$	1.3	4.5	$30.0^{+0.5}_{-0}$	$25.0^{+0.4}_{-0}$	$20.0^{+0.4}_{-0}$

Note — Screw designation numbers are in accordance with IS: 451-1972 'Technical supply conditions for wood screws ($second\ revision$)'.

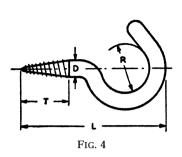
TABLE II DIMENSIONS OF SHOULDERED SQUARE HOOKS

(Clause 6.1 and Fig. 3)

All dimensions in millimetres.

	DESIGNATION	LENGTH	SCREW DESIG- NATION No.	NOMINAL DIA OF UNTHREA- DED SHANK	DIA OF SHOULDER	WIDTH OF SHOULDER	RADIUS BEHIND SHOULDER	BENT PORTION	TOTAL LENGTH OF SHANK	THREADED LENGTH OF SHANK
		L		D	E	Н	K	R	S	T
	15 × No. 3	$15.0^{+0.5}_{-0}$	3	2.39	$5.7^{+0.5}_{-0}$	0.6	2.0	$7.0^{+0.5}_{-0}$	$7.0^{+0.4}_{-0}$	$4.7^{+0.4}_{-0}$
	20 × No. 4	$20.0^{+0.5}_{-0}$	4	2.74	$6.5^{+0.5}_{-0}$	0.7	2.2	$9.0^{+0.5}_{-0}$	$9.0^{+0.4}_{-0}$	$6.5^{+0.4}_{-0}$
,	25 × No. 5	$25.0^{+0.5}_{-0}$	5	3.10	$7.5^{+0.5}_{-0}$	0.8	2.5	$11.0^{+0.5}_{-0}$	$11.0^{+0.4}_{-0}$	$8.0^{+0.4}_{-0}$
	$35 \times No. 7$	35 + 1 - 0	7	3.81	$9.7^{+0.5}_{-0}$	1.0	3.2	$15.0^{+0.5}_{-0}$	$16.0^{+0.4}_{-0}$	$12.5^{+0.4}_{-0}$
	$40 \times No. 8$	40 + 1 - 0	8	4.17	$10.0^{+0.5}_{-0}$	1.1	3.5	$18.0^{+0.5}_{-0}$	$18.0^{+0.4}_{-0}$	$14.0^{+0.4}_{-0}$
	50 × No. 10	50 + 1 - 0	10	4.88	$10.8^{+0.5}_{-0}$	1.2	4.0	$22.0^{+0.5}_{-0}$	$22.0^{+0.4}_{-0}$	$17.5^{+0.4}_{-0}$
	50 × No. 12	50 + 1 - 0	12	5.59	$11.5^{+0.5}_{-0}$	1.3	4.5	$24.0^{+0.5}_{-0}$	$25.0^{+0.4}_{-0}$	$20.0^{+0.4}_{-0}$

NOTE — Screw designation numbers are in accordance with IS: 451-1972 'Technical supply conditions for wood screws ($second\ revision$)'.



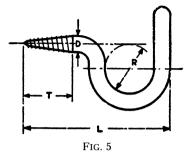


TABLE III DIMENSIONS OF PLAIN CUP AND RULER HOOKS

(Clause 6.1 and Fig. 4 and 5)

All dimensions in millimetres.

DESIGNATION	LENGTH	SCREW DESIGNATION NO.	Nominal Dia of Unthreaded Shank	DIA OF HOOK	THREADED LENGTH OF SHANK
	L		D	R	T
25 × No. 5	$25.0^{+0.5}_{-0}$	5	3.10	8.0 ^{+ 0.5} - 0	$8.0^{+0.4}_{-0}$
*30 × No. 7	30 + 1 - 0	7	3.81	$10.0^{+0.5}_{-0}$	$10.0^{+0.4}_{-0}$
*40 × No. 8	40 + 1 - 0	8	4.17	$12.0^{+0.5}_{-0}$	$12.0^{+0.4}_{-0}$
*45 × No. 8	45 + 1 - 0	8	4.17	$16.0^{+0.5}_{-0}$	$15.0^{+0.4}_{-0}$
*50 × No. 8	50 + 1 - 0	8	4.17	$20.0^{+0.5}_{-0}$	$18.0^{+0.4}_{-0}$

^{*}These sizes are normally available in plain cup hooks only.

Note — Screw designation numbers are in accordance with IS : 451-1972 'Technical supply conditions for wood screws ($second\ revision$)'.

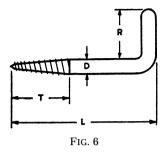


TABLE IV DIMENSIONS OF PLAIN SQUARE HOOKS

(*Clause* 6.1 and *Fig.* 6)
All dimensions in millimetres.

DESIGNATION	LENGTH	SCREW DESIGNATION NO.	Nominal Dia of Unthreaded Shank	DIA OF HOOK	THREADED LENGTH OF SHANK
	L		D	R	T
$20 \times No. 4$	$20.0^{+0.5}_{-0}$	4	2.74	$8.0^{+0.5}_{-0}$	$8.0^{+0.4}_{-0}$
25 × No. 5	$25.0^{+0.5}_{-0}$	5	3.10	$9.0^{+0.5}_{-0}$	$10.0^{+0.4}_{-0}$
*30 × No. 6	30 + 1 - 0	6	3.45	$10.0^{+0.5}_{-0}$	$14.0^{+0.4}_{-0}$
40 × No. 7	40 + 1 - 0	7	3.81	$12.0^{+0.5}_{-0}$	$15.0^{+0.4}_{-0}$
50 × No. 9	50 + 1 - 0	9	4.52	$16.0^{+0.5}_{-0}$	$20.0^{+0.4}_{-0}$
60 × No. 12	60 + 1 - 0	12	5.59	$20.0^{+0.5}_{-0}$	$24.0^{+0.4}_{-0}$
*75 × No. 14	75 + 1 - 0	14	6.30	$25.0^{+0.5}_{-0}$	$28.0^{+0.4}_{-0}$

^{*}These sizes are normally available in steel only.

NOTE — Screw designation numbers are in accordance with IS : 451-1972 'Technical supply conditions for wood screws ($second\ revision$)'.

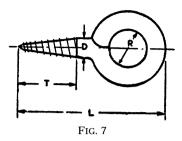


TABLE V DIMENSIONS OF SCREW EYES

(Clause 6.2 and Fig. 7)

All dimensions in millimetres.

DESIGNATION	LENGTH	SCREW DESIGNATION NO.	Nominal Dia of Unthreaded Shank	DIA OF EYE	THREADED LENGTH OF SHANK
	L		D	R	T
*16 × No. 0	$16.0^{+0.5}_{-0}$	0	1.52	$4.0^{+0.5}_{-0}$	$5.5^{+0.4}_{-0}$
$20 \times No. 1$	$20.0^{+0.5}_{-0}$	1	1.78	$5.5^{+0.5}_{-0}$	$6.5^{+0.4}_{-0}$
22 × No. 2	$22.0^{+0.5}_{-0}$	2	2.08	$6.5^{+0.5}_{-0}$	$7.5^{+0.4}_{-0}$
25 × No. 3	$25.0^{+0.5}_{-0}$	3	2.39	$6.5^{+0.5}_{-0}$	$9.5^{+0.4}_{-0}$
$25 \times No. 4$	$25.0^{+0.5}_{-0}$	4	2.74	$7.0^{+0.5}_{-0}$	$9.0^{+0.4}_{-0}$
30 × No. 5	30 + 1 - 0	5	3.10	$7.5^{+0.5}_{-0}$	$12.0^{+0.4}_{-0}$
$30 \times No. 6$	30 + 1 - 0	6	3.45	$8.0^{+0.5}_{-0}$	$11.0^{+0.4}_{-0}$
35 × No. 8	35 + 1 - 0	8	4.17	$9.0^{+0.5}_{-0}$	$12.0^{+0.4}_{-0}$
40 × No. 10	40 + 1 - 0	10	4.88	$10.0^{+0.5}_{-0}$	$12.5^{+0.4}_{-0}$
45 × No. 12	45 + 1 - 0	12	5.59	$11.0^{+0.5}_{-0}$	$15.0^{+0.4}_{-0}$
50 × No. 14	$50 + 1 \\ -0$	14	6.30	$11.0^{+0.5}_{-0}$	$19.0^{+0.4}_{-0}$

*This size is normally available in steel only.

Note — Screw designation numbers are in accordance with IS : 451-1972 'Technical supply conditions for wood screws ($second\ revision$)'.

7. FINISH

7.1 Unless otherwise specified, hooks and eyes shall be finished bright.

8. INSPECTION

8.1 The purchaser or his representative shall, if desired, be granted facilities for inspection of finished goods prior to delivery.

9. PACKING

 $\bf 9.1$ Hooks and eyes shall be packed in cardboard boxes in quantities specified below:

Article	Length	Number to be Packed in One Box
Shouldered cup, ruler	Up to and including	
and square hooks	40 mm	100
•	40 mm Over 40 mm	50
Plain cup and ruler		
hooks	All sizes	100
Plain square hooks	Up to and including	
•	{ 60 mm	100
	Over 60 mm	50
Screw eyes	Up to and including 3.10 mm dia	100
	Over 3.10 mm dia	50

10. MARKING

- **10.1** Each box of hooks and eyes shall be marked with the following information:
 - a) Manufacturer's name or trade-mark,
 - b) Description of contents,
 - c) Size of article, and
 - d) Quantity.
- **10.1.1** The box may also be marked with the ISI Certification Mark.

Note — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder, The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

11. SCALE OF SAMPLING AND CRITERION FOR CONFORMITY

- **11.1** In any consignment, all the hooks and eyes of the same type and size manufactured at the same time, shall be grouped together to constitute a lot.
- **11.2 Lot Size and Sample Size** The number of hooks and eyes to be selected from the lot shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Table VI.

TABLE VI SCALE OF SAMPLING AND CRITERION FOR ACCEPTANCE(Clauses 11.2 and 11.4)

LOT SIZE	SAMPLE SIZE	PERMISSIBLE NO. OF DEFECTIVE HOOKS AND EYES
(1)	(2)	(3)
Up to 200	15 20	0
201 ,, 300 301 ,, 500	30	2
501 ,, 800 801 and above	40 55	2 3

 ${
m Note}$ — The sampling plan given here is such that lots with 1.5 percent or less defectives will be accepted most of the times.

- **11.2.1** The hooks and eyes for testing shall be selected at random from at least 10 percent of the packages subject to a minimum of three packages, equal number of hooks and eyes being selected from each such package.
- **11.3 Tests** All hooks and eyes selected as in **11.2** shall be checked for dimensional requirements (see~6), defects in manufacture (see~5) and finish (see~7). Any hook or eye which fails to satisfy any one or more of the requirements for the characteristics shall be considered as a defective hook or eye.
- **11.4 Criterion for Conformity** The lot shall be considered as conforming to the requirements of this standard if the number of defective hooks or eyes among those inspected does not exceed the corresponding number given in col 3 of Table VI. Otherwise, it shall be considered as not conforming to the requirements of the standard.
- **11.4.1** For conformity to the requirements of the material, the manufacturer shall provide a certificate of compliance to the requirements of the corresponding Indian Standards (see 4).

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed by Technical Committee: BDC 15 and amended by EDC 27

Amendments Issued Since Publication

Amend No.	Date of Issue	
Amd. No. 1	Incorporated earlier	
Amd. No. 2	January 1988	

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Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	$ \begin{cases} 832 \ 92 \ 95, \ 832 \ 78 \ 58 \\ 832 \ 78 \ 91, \ 832 \ 78 \ 92 \end{cases} $
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