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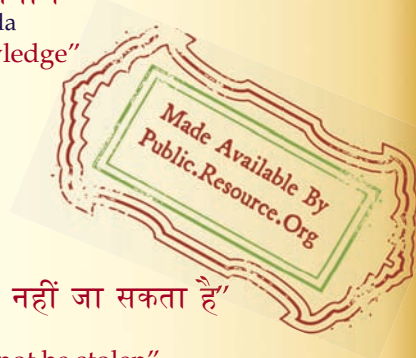
IS 453 (1993): Double Acting Spring Hinges -Specification
[CED 15: Builder Hardware]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

दोहरे कार्य करने वाले स्प्रिंग कब्जों की विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

DOUBLE-ACTING SPRING HINGES —
SPECIFICATION

(*Third Revision*)

UDC 683.36

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

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Builders Hardware Sectional Committee had been approved by the Civil Engineering Division Council.

The specification for double-acting spring hinges was first published in 1953 and subsequently revised in 1963 and 1973. This revision of the standard makes reference to the latest Indian Standards for various types of materials specified therein consequently, it also indicates the designations for various materials in accordance with the latest version of these standards.

In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

The Committee responsible for the preparation of this standard is given in Annex C.

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.

Indian Standard

DOUBLE-ACTING SPRING HINGES — SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard lays down the requirements for material, dimensions manufacture, finish and tests of double-acting spring hinges and corresponding blank hinges used generally for swing doors.

2 REFERENCES

2.1 The Indian Standards listed in Annex A are necessary adjuncts to the standard.

3 TYPES

3.1 Double-acting spring hinges shall be of the following two types according to the material used:

- a) Mild steel double-acting spring hinges, and
- b) Brass double-acting spring hinges.

4 MATERIAL

4.1 Mild Steel Sheets

Mild steel sheets and plates used in the manufacture of mild steel double-acting spring hinges shall conform to Grade 0 of IS 1079 : 1989 and shall satisfy the following bend test:

‘Suitable test pieces when cold, shall withstand without fracture, being doubled over, either by pressure or by blows from a hammer, until the internal diameter is equal to twice the thickness of the test piece and the sides become parallel’.

4.2 Mild Steel Wire

Mild steel wire used for hinge pin shall have a tensile strength of 40 kgf/mm², *Min* conforming to $\frac{1}{4}$ H of IS 280 : 1978 and shall satisfy the wrapping test given below:

‘It shall withstand without breaking or splitting being wrapped 8 times round its own diameter and subsequently straightened’.

4.3 Cast Brass

Cast brass used in the manufacture of brass double-acting spring hinges shall conform to Grade 3 of IS 292 : 1983.

4.4 Brass Sheets

Brass sheets used in the manufacture of brass double-acting spring hinges shall conform to alloy designation CuZn 40 of IS 410 : 1977.

4.5 Brass Rods

Brass rods used in the manufacture of brass double-acting spring hinges shall have copper contents not less than 60 percent and tensile strength 40 kgf/mm², *Min* (Grade 2 or 3) and shall conform to IS 319 : 1989.

4.6 Steel Wire

Steel wire for springs shall conform to Grade 1 or Grade 2 of IS 4454 (Part 1) : 1991.

4.7 Phosphor Bronze Wire

Phosphor bronze wire for springs shall conform to Grade 1 of IS 7608 : 1987.

5 SIZES

5.1 Double-acting spring hinges and corresponding blank hinges shall be of the following sizes:

<i>Size of Spring Hinge</i>	<i>Size of Blank Hinge</i>
mm	mm
100	70
125	75
150	75

6 DIMENSIONS

6.1 The leading dimensions of double-acting spring hinges shall conform to those specified in Fig. 1 and 2.

7 MANUFACTURE

7.1 Mild Steel Hinges

The cylindrical casing shall be made either from mild steel sheet of 1.60 mm thickness, lap-jointed and brazed, welded or rivetted; or from solid drawn tube of thickness not less than 1.60 mm; or from mild steel sheet of 1.60 mm thickness, pressed to form the two casings and the distance piece. The casing shall be

closed at both ends by mild steel caps having inside ends like forks to engage the ends of the spring. The flaps shall be of mild steel sheet of 1.60 mm thickness. In each casing, one of the caps shall be secured to the casing by means of a rivet and the other cap to the flap by means of a removable pin. The forks shall engage with the two ends of the spring. The casing, the flaps and the caps shall be held together by a mild steel spindle of 4 mm diameter fitted with an ornamental cap at each end (see Fig. 1).

7.1.1 Blank hinge shall be made from mild steel sheet of 2.00 mm thickness and shall conform to the dimensions specified in Fig. 1.

7.2 Brass Hinges

The cylindrical casing shall be made either from brass sheet of 1.60 mm thickness, lap-jointed and brazed, or from solid drawn brass tube of not less than 1.60 mm thickness. The casing shall be closed at both ends with cast brass caps machined to accommodate the forks. The forks may be of mild steel or rolled brass forged and turned to shape and finished as shown in Fig. 2. The connecting piece shall be of cast brass and shall be brazed on to the caps at both ends. The flaps shall also be of cast brass or extruded sections of brass and shall conform to the thickness given below. In each casing, one of the forks shall be fixed to the cap and the other to the flap by means of removable pins. The forks shall engage the two ends of the spring:

Size of Brass Hinges	Thickness of Flap	
	Cast Brass	Extruded Brass
mm	mm	mm
100	4.0	3.2
125	5.0	4.0
150	5.6	5.0

7.2.1 Blank hinges shall be made of cast brass or extruded sections of brass and the thickness of flap shall conform to that specified for the corresponding sizes of spring hinges.

8 FINISH

8.1 Unless otherwise specified, the finish of the hinges shall be as follows:

- Mild Steel Hinges* — stove-enamelled black or copper-oxidized.
- Brass Hinges* — satin, bright, nickle-plated, or copper-oxidized.

9 PERFORMANCE TESTS

9.1 Double-acting spring hinge shall work smoothly when fitted on swing doors, the hinge shall hold the door vertical and in its normal closed position.

9.2 Each double-acting spring hinge shall withstand the following tests which shall be carried out after fixing it to a swing door in the normal manner:

- When the door is pushed through 90° and released 2 000 times on each side in quick succession the hinge shall show no sign of damage or any appreciable deterioration of the components during or on completion of the test.
- The door shall require a force of 2.0 ± 0.5 kg for 100 mm hinges and 3.0 ± 0.5 kg for 125 mm and 150 mm hinges, at a distance of 45 cm from the hinge pin to move the door through 90°.

10 MARKING

10.1 The hinge may also be marked with the Standard Mark.

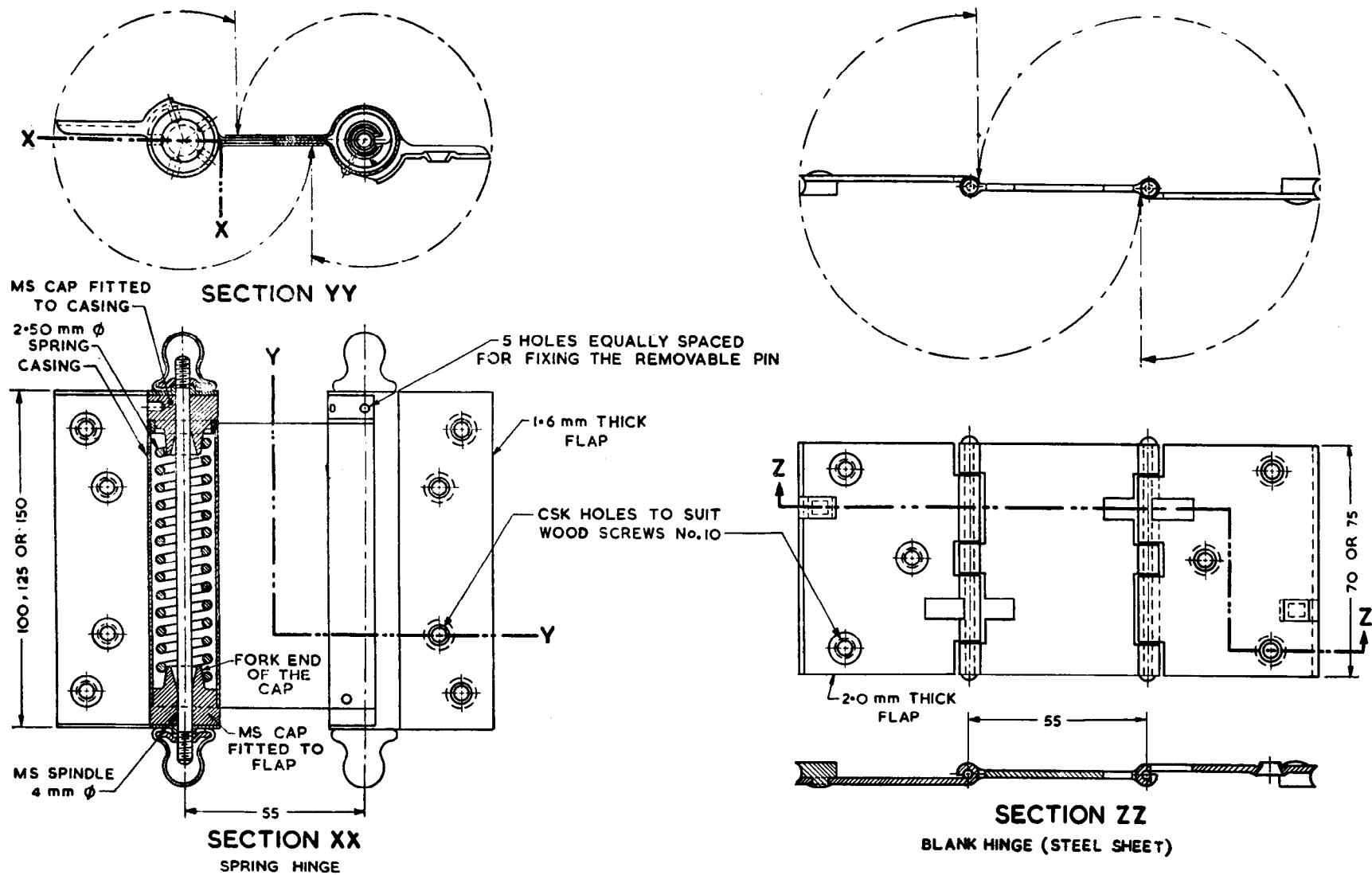
11 PACKING

11.1 Each hinge shall be wrapped individually in craft paper and packed in cartons to prevent ingress of moisture.

11.2 Each package shall be labelled with the name or trade-mark of the manufacturer, particulars of the quantity, description and contents, size and type (blank or double acting) of hinges.

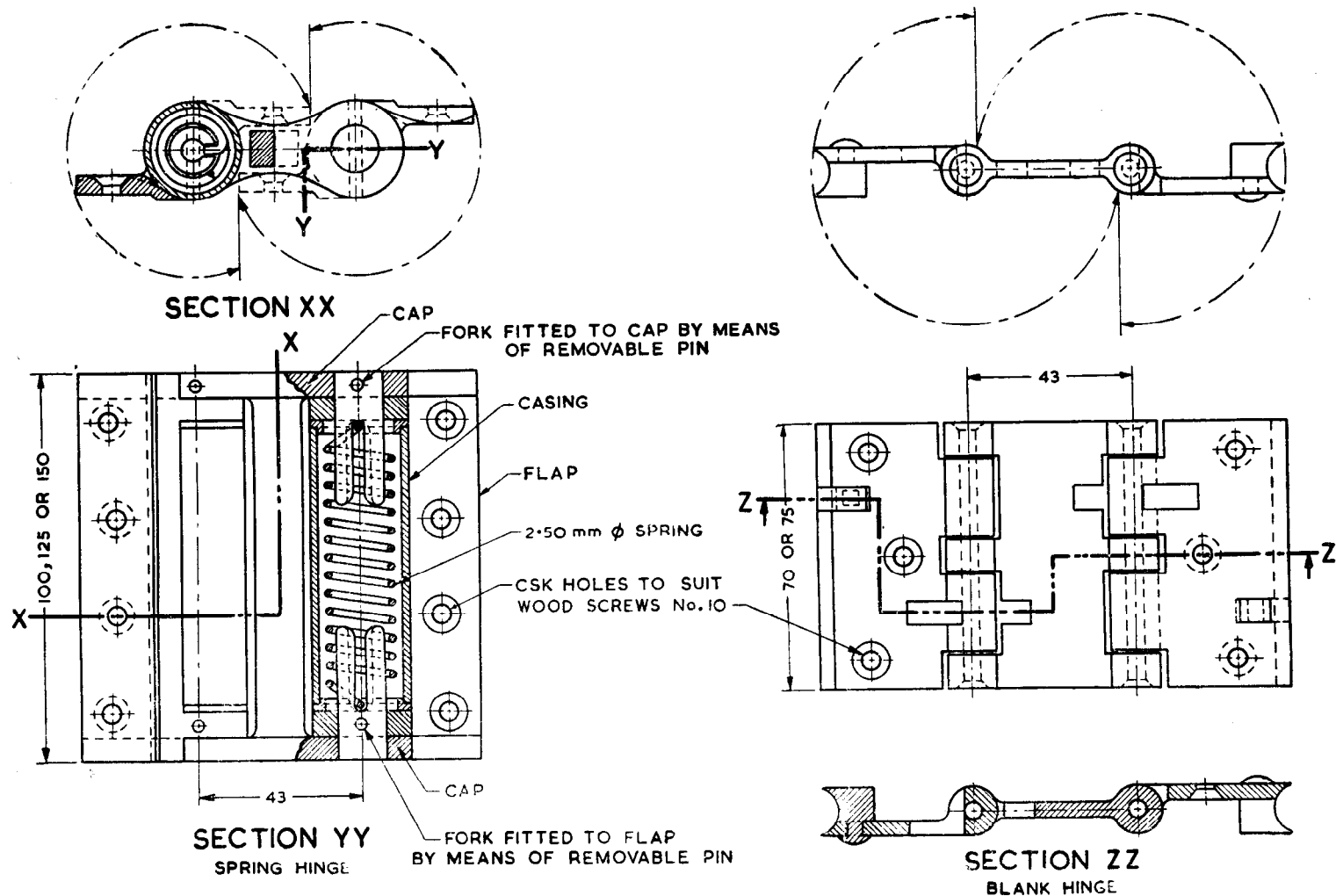
12 SAMPLING AND CRITERION FOR CONFORMITY

12.1 The scale of sampling of double-acting spring hinges and criteria for conformity shall be as given in Annex B.



All dimensions in millimetres.

FIG. 1 TYPICAL DESIGN OF MILD STEEL DOUBLE-ACTING SPRING HINGE



All dimensions in millimetres.

FIG. 2 TYPICAL DESIGN OF BRASS DOUBLE-ACTING SPRING HINGE

ANNEX A

(Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
280 : 1978	Mild steel wire for general engineering purposes (<i>third revision</i>)	4454 (Part 1) : 1981	Steel wires for cold formed springs : Part 1 Patented and cold drawn steel wires — Unalloyed (<i>second revision</i>)
292 : 1983	Leaded brass ingots and castings (<i>second revision</i>)	4905 : 1968	Methods for random sampling
319 : 1989	Free cutting brass bars, rods and sections (<i>fourth revision</i>)	7608 : 1987	Phosphor bronze wire for general engineering purposes (<i>first revision</i>)
410 : 1977	Cold rolled brass sheet, strip and foil (<i>third revision</i>)		

ANNEX B

(Clause 12.1)

SCALE OF SAMPLING AND CRITERION FOR CONFORMITY

B-1 LOT

B-1.1 In any consignment, all the spring hinges of the same type and size and manufactured at the same time shall be grouped together to constitute a lot.

B-2 LOT SIZE AND SAMPLE SIZE

B-2.1 The number of spring hinges 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 1.

Table 1 Scale of Sampling and Criterion for Conformity
(Clause B-2-1)

Lot Size	Sample Size	Permissible No. of Defective Spring Hinges
(1)	(2)	(3)
Up to 100	13	0
101 to 300	20	1
301 „ 500	32	2
501 „ 1 000	50	3
1 001 and above	80	5

B-2.1.1 The number of spring hinges to be selected in the sample depends upon the size of

the lot and shall be in accordance with col 1 and 2 of Table 1. These spring hinges shall be selected at random and for this purpose, reference may be made to IS 4905 : 1968.

B-3 TESTS

B-3.1 All spring hinges selected as in **B-2.1** shall be checked for dimensional requirements (*see 6*), manufacturing defects (*see 7*) and finish (*see 8*). Any spring hinge which fails to satisfy the requirements of any one or more of the characteristics shall be considered as a defective spring hinge.

B-4 CRITERION FOR CONFORMITY

B-4.1 The lot shall be considered as conforming to the requirements of this standard if the number of defective spring hinges among those inspected does not exceed the corresponding number given in col 3 of Table 1; otherwise it shall be considered as not conforming to the requirements of this standard. 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*).

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Builders Hardware Sectional Committee, CED 15

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SHRI BALKRISHAN AGARWAL (*Alternate*)

SHRI A. BANDOPADHYAY

SHRI GURUSWAMY (*Alternate*)

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Director (Civ Engg)

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Findalco Industries Ltd, Bombay

Regional Testing Centre, Northern Region, Ministry of Industry,
New Delhi

Mech (India) Industries, Delhi

Delhi Development Authority, New Delhi

National Test House, Calcutta

Railway Board (Ministry of Railways)

D. P. Garg and Co, Noida

Ministry of Defence, (DGI) New Delhi

Fixopan Engineers Pvt Ltd, New Delhi

Directorate General of Supplies and Disposals, New Delhi

Indian Institute of Architects, Bombay

Argent Industries, New Delhi

Indian Aluminium Co Ltd, Calcutta

Engineer-in-Chief's Branch, Army Headquarters, New Delhi

J. H. Aluminium Pvt Ltd, Madras

Building Material and Technology Promotion Council,
New Delhi

National Building Organization, New Delhi

Tamil Nadu Housing Board, Madras

Central Building Research Institute (CSIR), Roorkee

M. C. Mowjee and Co Pvt Ltd, Calcutta

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Joint Director (Civ Engg), BIS

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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 Handbook' and 'Standards Monthly Additions'. Comments on this Indian Standard may be sent to BIS giving the following reference:

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