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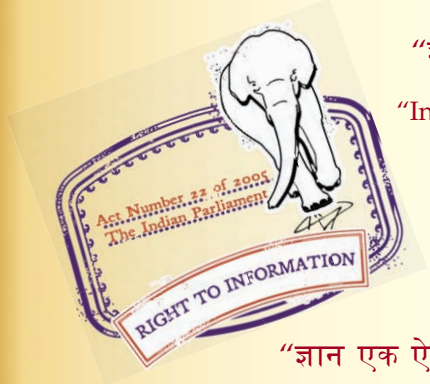
IS 6315 (1992): Floor springs (hydraulically regulated) for heavy doors - [CED 15: Builder Hardware]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 6315 : 1992
(Reaffirmed 2001)

भारतीय मानक

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(दूसरा पुनरीक्षण)

Indian Standard

FLOOR SPRINGS (HYDRAULICALLY REGULATED) FOR HEAVY DOORS — SPECIFICATION

(Second Revision)

UDC 683·372

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

February 1992

Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Builder's Hardware Sectional Committee had been approved by the Civil Engineering Division Council.

Automatic door closing devices are becoming very popular due to the fact that in air conditioned public buildings, with a high frequency of the use of doors, prevention of temperature losses assume great importance.

It is also essential that the devices should be compact in shape and size and at the same time easy to mount. The heavy entrance doors used in public buildings need special attention, at the same time devices fixed thereto should cater for long service periods to which these are subjected.

This standard was first published in 1971 and revised in 1986. It is now being revised to do general updation and specifying the raw materials for piston, cylinder, top centre pivot and pier separately. The important change relate to materials used in the manufacture of above mentioned parts of floor springs.

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.

AMENDMENT NO. 1 AUGUST 2010
TO
IS 6315 : 1992 FLOOR SPRINGS (HYDRAULICALLY REGULATED) FOR HEAVY DOORS — SPECIFICATION

(Second Revision)

(*Page* 3, *Table* 1) — Add the following under Sl No. (ix):

Material (3)	**Conforming to Indian Standard** (4)
e) Stainless steel, 1.00 mm, *Min*, in thickness (*see Note*)	Grade X 15 Cr 16Ni2 or X07Cr 18Ni9 of IS 6911

NOTE — Stainless steel screws shall be used in fixing stainless steel covers.

(*Page* 5, *Annex* A) — Add the following at the end:

'IS 6911 : 1992 Stainless steel plate, sheet and strip (*first revision*)'

(CED 15)

Reprography Unit, BIS, New Delhi, India

Indian Standard

FLOOR SPRINGS (HYDRAULICALLY REGULATED) FOR HEAVY DOORS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements for concealed type floor springs (hydraulically regulated) for vertical doors weighing not more than 125 kg. In case of doors consisting of more than one leaf the weight of each leaf shall not exceed 125 kg.

2 REFERENCES

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

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Floor Spring (Hydraulically Regulated)

A device used to close the door so as to slow down its speed before it reaches the closed position, hereinafter called floor spring.

3.2 Single Action Floor Spring (Hydraulically Regulated)

A device used to close the door in one direction only so as to slow down its speed before it reaches its closed position.

3.3 Double Action Floor Spring (Hydraulically Regulated)

A device used to close the door in both directions so as to slow down its speed before it reaches its closed position.

3.4 Right Hand Floor Spring

A floor spring suitable for use on an anti-clockwise door.

NOTE — An anticlockwise door is one which, when viewed from above, rotates in an anticlockwise direction about its hinges while opening.

3.5 Left Hand Floor Spring

The floor spring suitable for use on a clockwise door.

NOTE — A clockwise door is one which, when viewed from above, rotates in a clockwise direction about its hinges while opening.

3.6 Shoe

The device fixed to the bottom of the door leaf in order to hoist it to the floor spring.

3.7 Top Centre Pivot

The device to secure the upper portion of the door leaf and the door frame above.

4 TYPE AND SIZE

Typical details of a floor spring (hydraulically regulated) are given in Fig. 1.

5 MATERIALS

Material for the manufacture of various parts of floor spring are given in Table 1.

6 MANUFACTURE AND CONSTRUCTION

6.1 The floor springs shall be suitable for fixing to the doors weighing up to 125 kg without use of additional door units.

6.2 The floor spring shall operate smoothly and easily without undue delay during the opening and closing operations.

7 DIMENSIONS AND TOLERANCES

The dimensions and tolerances of floor springs shall be as agreed to between the purchaser and the manufacturer.

8 CONSTRUCTION

8.1 The oil-check shall work satisfactorily at all temperatures between 49°C and −10°C without requiring any other change except by the adjustment of the capstan nut.

8.2 The speed of closing the door shall be adjustable by means of a suitable controlling device. Tension of the spring shall be increased or decreased by turning the capstan nuts

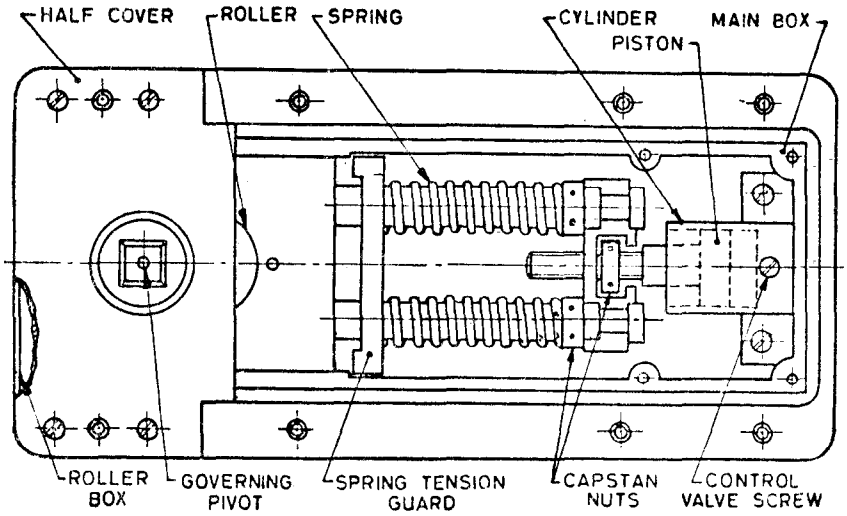

FIG. 1 TYPICAL DETAILS OF FLOOR SPRING (HYDRAULICALLY REGULATED)

clockwise or anticlockwise. For exceptionally low temperature, the adjustment in the speed could be made by the change in the grade of oil.

8.3 The shoe shall be fitted to the governing pivot of the floor spring by a square profile so that it stands horizontally parallel with the top cover plate of the floor spring. Provisions shall be made in the shoe for adjusting the door leaf to the final closing position by turning a screw.

8.4 Top-centre pivot shall be securely fitted so that the door panel can easily make a circular motion and the door can be horizontally and vertically adjusted and the door leaf can be taken out of the door frame when required.

8.5 Possibility of leakage under working conditions should be carefully guarded. The governing pivot should contain a hole to pass out the air from inside and to maintain the accuracy of the air pressure so that the pressure inside is always in keeping with the outer level.

8.6 Precaution should be taken to seal the joint effectively with filler when the steel cover plate is fixed and it shall be possible to remove the same, whenever necessary. There should be a device on the steel cover plate through which the oil-check device can be adjusted and the hole shall remain closed with a screw so that no oil can splash through it.

8.7 When opened at a right angle, the door shall stand open till it is pushed to close.

9 PERFORMANCE REQUIREMENTS

9.1 The samples shall be picked out in accordance with Annex B. A sample shall then be mounted to door leaf weighing 125 kg and subjected to total 50 000 operations at the rate of 6 to 8 operations per minute. The number of operations that shall be carried out continuously at any time during the test shall not be less than 3 000. One opening and closing shall constitute one operation. In the case of double action floor springs, the door leaf shall be opened through 90° in clockwise direction and then released to swing back to its original position. This operation shall be repeated 25 000 times. After that, similar 25 000 operations shall be made by opening the door leaf through 90° in anticlockwise direction. The test shall be carried out at the normal prevailing conditions. At the end of the test, floor springs shall not show any change or deterioration in its working.

9.2 The closing time of the floor spring shall be easily adjustable between 3 and 20 seconds for which a suitable device to adjust the speed shall be provided.

9.3 After being fitted in position the door leaf shall be opened through 90° plus and released. The door will stand open till pushed back in the closing position. When opened to an angle less than a right angle, the door shall swing back automatically.

Table 1 Requirements for Materials for Floor Springs

(*Clause* 5)

Sl No.	Part	Material	Conforming to Indian Standard
(1)	(2)	(3)	(4)
i)	Foundation box, main body and half cover	a) Cast brass, 2 mm, *Min* in thickness (*see* Note)	LCB 2 of IS 292 : 1983
		NOTE — Copper content shall be not less than 60 percent. Castings shall be free from blow holes, surface and other casting defects.	
		b) Brass sheet, 1·25 mm, *Min*, in thickness	Alloy Designation CuZn 40 of IS 410 : 1977
		c) Mild steel sheet, 1·25 mm, *Min*, in thickness	Fe 410 S of IS 226 : 1975
		d) Cast iron	FG 200 of IS 210 : 1978
		e) Aluminium alloy pressure die-casting, 2 mm *Min*, in thickness	4600 M of IS 617 : 1975
		f) Aluminium alloy sheet, 1·25 mm, *Min*, in thickness	IS Designation 52000 or 65032 W of IS 737 : 1986
		g) Zinc base alloy pressure die-castings, 2 mm *Min*, in thickness	ZnA14 or ZnA14 Cu1 of IS 742 : 1981
ii)	Spring tension guard	Mild steel	—
iii)	Spring rod	Mild steel	—
iv)	a) Piston	Mild steel	IS 226 : 1975
	b) Cylinder	Mild steel or cast iron	IS 226 : 1975 IS 210 : 1978
v)	Governing pivot	Mild steel or cast iron	IS 226 : 1975 or FG 200 of IS 210 : 1978
vi)	Rollers	Mild steel or carbon steel (tempered)	—
vii)	Roller box	Mild steel sheet	—
viii)	Cover sheet (inner)	Mild steel sheet, 2 mm, *Min*, in thickness	—
ix)	Top cover	a) Brass,	—
		b) Brass sheet, 1·25 mm, *Min*, in thickness	—
		c) Aluminium alloy pressure casting 2 mm in thickness	—
		d) Aluminium alloy sheet 2 mm, *Min*, in thickness	
x)	Piston player	Gun metal or steel	—
xi)	Spring	Spring steel	VW of IS 4454 (Part 2): 1975
xii)	Hydraulic oil	—	IS 3098 : 1983
xiii)	Shoe adjuster	Mild steel	—
xiv)	Shoe	Cast brass with gun metal follow and adjuster or mild steel.	—
xv)	a) Top centre pivot	Zinc alloy Aluminium alloy	IS 742 : 1981 IS 617 . 1975
	b) Pin	Brass Mild steel	IS 320 : 1980 IS 226 : 1975

9.4 A force of not more than 20 N shall be required, at a distance of one metre from the frame, to open the door leaf weighing 125 kg through 90 degrees.

10 WORKMANSHIP

The floor springs shall be free from all mechanical defects, sharp edges and other surface defects.

11 FINISH

11.1 The hydraulic floor spring should be covered by one brass/aluminium sheet which only will flush on the floor. The cover sheet, shoe and top-centre will be polished or electroplated as agreed to between the purchaser and the manufacturer.

11.2 Mild steel parts may be given the treatment in accordance with **11.2.1** to **11.2.3**.

11.2.1 All dents, burrs and sharp edges shall be removed from various components and they shall be pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign element.

11.2.2 After pickling all the mild steel parts shall be given phosphating treatment in accordance with IS 3618 : 1966 followed by a coat of suitable primer, such as red oxide.

NOTE — Filler shall be applied to all surfaces requiring filling and shall conform to IS 110 : 1983.

11.2.3 Two coats of enamel paint shall then be applied as follows:

a) Undercoat, and

b) Finish coat with synthetic stoving enamel conforming to IS 2932 : 1974 and IS 2933 : 1975.

11.2.3.1 The components shall, thereafter, be baked at a specified temperature in an oven heated uniformly. The finish shall be smooth and uniform with a hard and tough film of enamel strongly adhering to the surface. The finish shall be free from all visible defects and shall not chip, when tapped lightly with a pointed instrument.

12 MARKING

12.1 Each floor spring shall be stamped with the following information:

a) Indication of the source of manufacture,

b) Year of manufacture, and

c) Country of origin.

12.2 The floor spring may also be marked with the Standard Mark.

13 PACKING

Each floor spring shall be wrapped in suitable craft paper or polyethylene and packed in a cardboard box. Each carboard box shall be marked with the following information:

a) Indication of the source of manufacture,

b) Quantity in the package,

c) Country of origin,

d) Year of manufacture, and

e) Overall dimensions of assembled floor springs.

14 SAMPLING AND CRITERIA FOR CONFORMITY

The method of drawing representive samples of material and the criteria for conformity is given in Annex B.

15 GUARANTEE

15.1 The manufacturer shall give a guarantee against any manufacturing defects for one year from the date of installation.

15.2 The manufacturer shall also supply the following with the floor spring:

a) Instructions for fixing the floor spring, and

b) Hydraulic oil necessary at the time of installation.

ANNEX A

(*Item* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
110 : 1983	Ready mixed paint, brushing, grey filler, for enamels for use over primers (*second revision*)	226 : 1975	Structural steel (standard quality) (*fifth revision*)
210 : 1978	Grey iron castings (*third revision*)	292 : 1983	Leaded brass ingots and castings (*second revision*)

IS No.	*Title*
320 : 1980	High tensile brass rods and sections (other than forgings stock) (*second revision*)
410 : 1977	Cold rolled brass sheet, strip and foil (*third revision*)
617 : 1975	Aluminium and aluminium alloys ingots and castings for general engineering purposes (*second revision*)
737 : 1986	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes (*third revision*)
742 : 1981	Zinc base alloy die castings (*second revision*)
2932 : 1974	Enamel, synthetic, exterior (a) undercoating, (b) finishing (*first revision*)
2933 : 1975	Enamel, exterior (a) undercoating, (b) finishing (*first revision*)
3098 : 1983	Oil, hydraulic, mineral oil type (*second revision*)
3618 : 1966	Phosphate treatment of iron and steel for protection against corrosion
4454 (Part 2) : 1975	Steel wires for cold formed spring : Part 2 Oil hardened and tempered spring steel wire and valve spring wire-unalloyed (*first revision*)

ANNEX B

(*Clauses* 9.1 *and* 14.1)

SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

B-1 SCALE OF SAMPLING

B-1.1 Lot

In any consignment, all the floor springs of the same type and size and manufactured from the same material under essentially similar conditions of production shall be grouped together to constitute a lot.

B-1.2 Sample Size

The number of floor spring to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

Table 2 Scale of Sampling and Permissible Number of Defective Floor Springs

(*Clause* B-1.2)

Lot Size	Sample Size	Permissible Number of Defective Floor Springs
(1)	(2)	(3)
Up to 100	5	0
101 to 150	8	0
151 to 300	13	0
301 to 500	20	1
501 to 1 000	32	2
1 001 and above	50	3

B-1.2.1 The floor springs for the sample shall be selected at random from at least 10 percent of the package subject to a minimum of three packages.

B-1.3 All the floor springs selected as in **B-1.2** shall be inspected for manufacture and construction, dimensional requirements and tested for the performance requirement. A floor spring failing in any one or more of requirements or the characteristics shall be considered as defective.

B-2 CRITERIA FOR CONFORMITY

B-2.1 The lot shall be considered as conforming to the requirements of specification if the number of the defectives found in the sample does not exceed the corresponding permissible number given in col 3 of Table 2, otherwise the lot shall be considered as not conforming to the requirements of this standard.

B-2.2 For conformity to the requirements of the material the manufacturer shall provide a certificate of compliance to the requirements of the corresponding Indian Standard (*see* col 4 of Table 1).

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard 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 BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standard

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Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

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Amend No.	Date of Issue	Text Affected

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