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IS 10451 (1983): steel sliding shutters (top hung type)
[CED 11: Doors, Windows and Shutter]



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(Reaffirmed 1996)

Indian Standard

SPECIFICATION FOR STEEL SLIDING SHUTTERS (TOP HUNG TYPE)

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

Indian Standard

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Indian Standard

SPECIFICATION FOR STEEL SLIDING SHUTTERS (TOP HUNG TYPE)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 19 January 1983, after the draft finalized by the Doors, Windows and Shutters Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Steel sliding shutters, top hung type, find extensive application in godowns, warehouses, etc, where the sliding of the shutters to the sides does not obstruct the adjacent openings. These are fixed on the outside only. Two types of shutters are generally in use, namely, top hung and bottom resting. This standard covers only the top hung type.

0.3 This standard contains clause **6.1** which requires the purchaser to provide the information at the time of placing of orders.

0.4 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 test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements regarding material, type, shape, fabrication, assembly and finish of the top hung steel sliding shutters.

2. TERMINOLOGY

2.0 For the purpose of this standard, the various components of the sliding shutters are defined in **2.1** to **2.4** (*see also* Fig. 1).

*Rules for rounding off numerical values (*revised*).

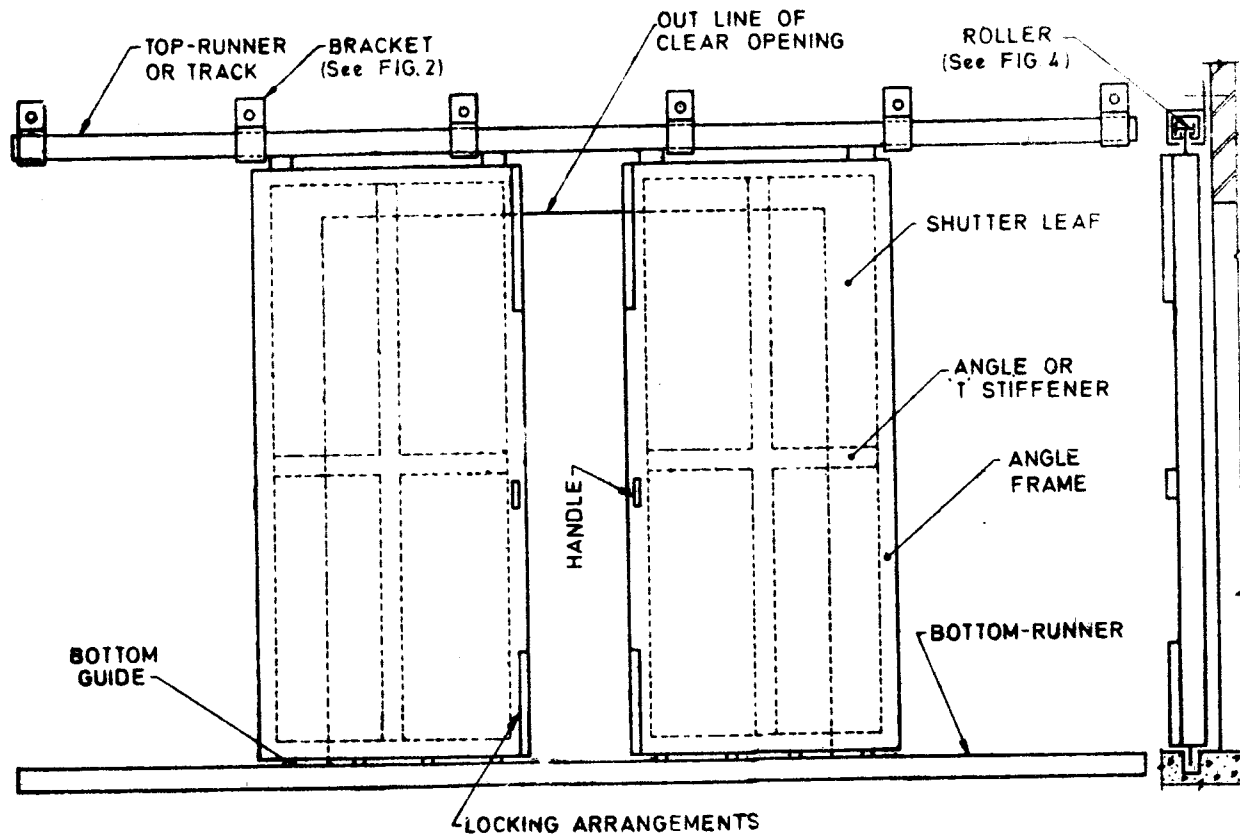


FIG. 1 TYPICAL ILLUSTRATION OF SLIDING DOOR SHUTTER WITH
TYPE B TRACK AND ROLLER MECHANISM

2.1 Shutter Leaf — A structural frame of angles or tees covered on one side or both sides with mild steel sheets, GI sheets, plain or corrugated; or rolling shutter laths.

2.2 Top Runner (or Track) — A mechanism on which the shutter leaf hangs and is slid over. This is made up of mild steel flats or angles or cold rolled mild steel special track sections.

2.3 Bottom Guide — An arrangement to guide the movement of the shutter at the bottom.

2.4 Gear Mechanism — An arrangement consisting of a pulley or a group of pulleys with or without ball bearings called 'trolley' which rolls over or within the track/top runner.

3. SIZE

3.1 Size — The size of the shutter shall be greater than the actual opening for weather protection. The height of the shutter shall be at least 150 mm more and width at least by 300 mm more than the size of the opening.

4. MATERIALS

4.1 Angles, tees, flats, channels, etc. shall be of rolled sections conforming to IS : 1977-1975*.

4.2 Cover — Hot rolled mild steel sheets of minimum 3.15 mm thickness conforming to Fe 310—O of IS : 1977-1975*.

4.3 Rolling Shutter Laths — These shall be at least 1.20 mm thick conforming to IS : 6248-1971†.

4.4 Top Runner (Track) — These shall be of cold rolled mild steel conforming to IS : 1977-1975* and capable of taking the design load for a smooth operation.

4.5 Pulleys or Trolleys — These shall be of grey iron castings or cast steel, conforming to IS : 210-1978‡ and IS : 1039-1974§ respectively.

5. FABRICATION

5.1 Sliding shutters may be with single leaf or two leaves. The shutter leaves shall be fabricated from mild steel angle frames using angles of size not less than 50 × 50 × 5 mm for shutters up to 2 m width and 2.5 m height and 65 × 65 × 6 mm for bigger sizes. Stiffeners shall be

*Specification for standard steel (ordinary quality) (*second revision*).

†Specification for metal rolling shutters and rolling grills (*first revision*).

‡Specification for grey iron castings (*third revision*).

§Specification for carbon steel castings for general engineering purposes (*second revision*).

provided with mild steel angle or mild steel tees at intervals not exceeding 1 m and covered on one or both sides with mild steel sheets of thickness not less than 3.15 mm or galvanized steel sheets of thickness not less than 2 mm or rolling shutter laths of thickness not less than 1.20 mm.

5.1.1 The framing pieces shall be suitably notched and welded with due particular attention to sequence of welding so as to avoid distortion.

5.1.2 The stiffening tees or angles shall be equally spaced vertically to suit the available width of sheets. Similarly, the horizontal stiffeners shall also be spaced depending on the length of the sheet.

5.1.2.1 In cases where rolling shutter laths are used for the covering, there shall be no restriction in the spacing of the stiffeners.

5.1.3 The vertical stiffeners shall be taken for the full height and only the horizontal stiffeners shall be out at the crossings.

5.1.4 The mild steel black sheet shall be tack welded to the inside of the frame, with 25 mm run of weld spaced 200 mm apart, paying due attention of welding sequence, to avoid distortion.

5.1.5 When sheet covering is done on both sides, the inner side shall be covered first by tacking as described in **5.1.4** and the outer side sheet shall be plug welded and ground so that the frame work within is not seen outside.

5.1.6 Welding of two or more sheets to get the desired width or length shall not be permitted.

5.1.7 When rolling shutter laths are used for covering, the lath shall be interlinked first and placed over the frame work of angle and tees and tack welded to the inside of the frame. If laths are to be provided on both sides, the second covering shall be plug welded in a similar manner as done in case of mild steel sheets (see **5.1.5**).

5.1.8 Locking and bolting arrangements shall be welded to the frames.

5.1.9 Separate brackets shall be provided for holding the sliding gears so that access is available for repairs at any time.

5.2 Top Runner or Track — The top track shall be either of the following types:

Type A — Track made out of a 12 × 80 mm flat securely anchored to the wall by 16 mm bolts spaced at 75 mm distance.

Type B — Cold rolled inverted 'U' type mild steel track fitted to the wall with special brackets as indicated in Fig. 2.

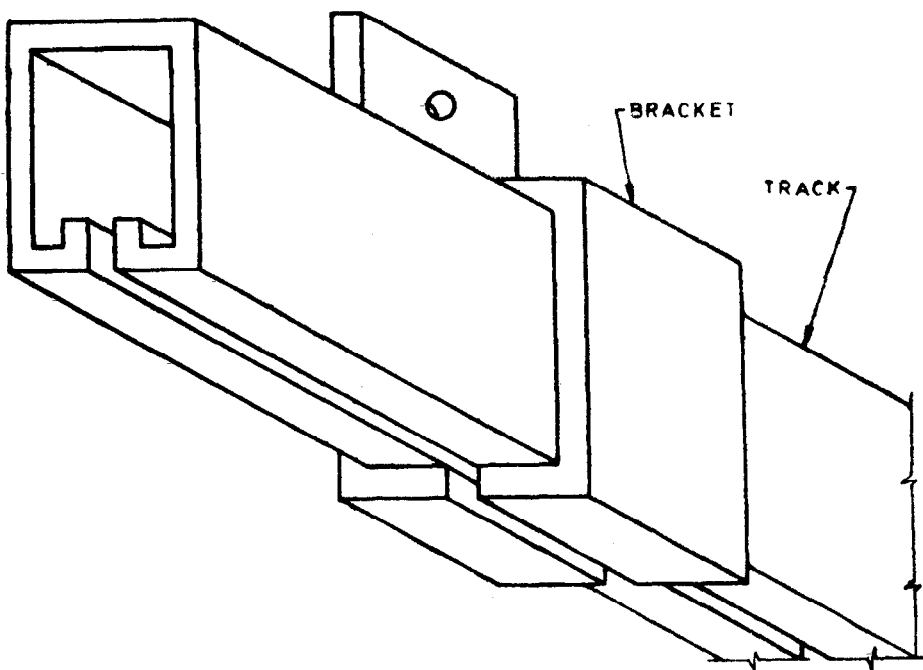


FIG. 2 TYPE B TRACK WITH BRACKET

5.2.1 Modifications in Type A track may be allowed by using of angles or rails or tees in place of the flat. Grooved pulleys and heavy brackets enclosing the pulleys shall be used in these tracks.

5.2.2 In the case of Type B track the pulley trolley shall travel within the 'U' frame and only a rod shall connect the trolley and the shutter, making it more elegant and safe.

5.2.3 In both the cases the track shall have a length more than double the width of the opening with stoppers at either end.

5.3 Bottom Runner — This shall be a rolled/formed or built-up channel of about $50 \times 40 \times 5$ mm through which a bottom guide attached to the shutter leaf slides; thus keeping the shutter in position. This shall be fixed to the floor with suitable hold-fasts.

5.4 Sliding Gear or Roller Mechanism — The roller mechanism is different for Type A and Type B tracks.

5.4.1 Type A roller mechanism shall consist of two cast iron pulleys of 150 mm diameter and with a groove of 12 mm width and depth along the circumference. These pulleys shall have minimum width of 30 mm. The pulleys shall be fixed to the shutter by a 10 mm thick mild steel bracket of width not less than 60 mm. The bracket shall be in the form of an inverted 'U' with one arm attached to the shutter leaf and other arm extended on the other side of the pulley fully covering the same so that the pulley may roll on the guide under equilibrium and without wobbling (see Fig. 3).

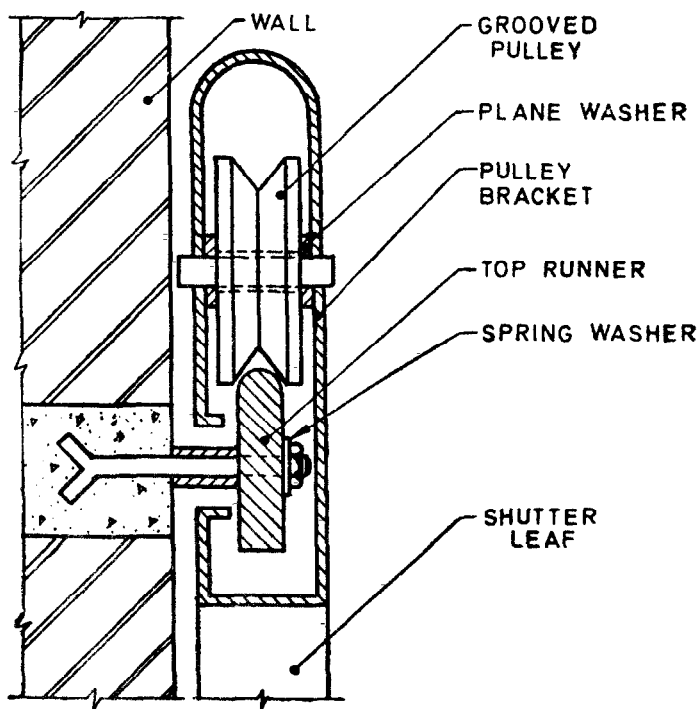


FIG. 3 PULLEY MECHANISM FOR TYPE A TRACK

5.4.2 Type B roller mechanism shall consist of twin or quadruple pulleys attached to a shaft as shown in Fig. 4. The pulleys are fitted with ball bearings and the size of the pulleys and shaft shall vary according to the load it has to carry. Usually, only the sets of trolleys shall be provided for each shutter leaf.

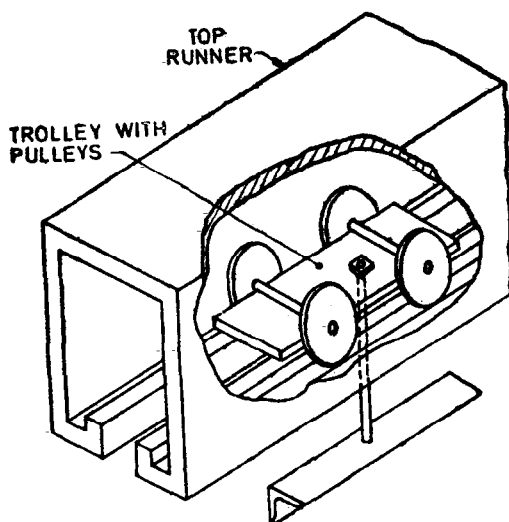


FIG. 4 ROLLER MECHANISM FOR TYPE B TRACK

5.4.3 While Type A roller may be used for any size of opening, Type B roller may be used up to 800 kg with two sets of trolleys and up to 1 200 kg with 3 sets of trolleys.

5.5 The bottom rollers attached to the shutter leaves shall not rest or roll on the bottom guide but only slide against the sides of the bottom channel.

6. INFORMATION TO BE SUPPLIED BY THE PURCHASER

6.1 The purchaser while placing orders for the supply of steel side sliding shutters shall furnish the following information to the manufacturer:

- a) Size of opening and number and size of the leaves;
- b) Details of construction around the opening;
- c) Type of roller mechanism;
- d) Type of covering; and
- e) Any other information.

7. FINISH AND MARKING

7.1 Finish — The shutters shall be finished with a coat of red oxide primer conforming to IS : 102-1962*.

*Specification for ready mixed paint, brushing, red lead, nonsetting, priming (revised).

7.2 Marking — Each shutter shall be marked with labels containing following information:

- a) Name of the manufacturer or the trade-mark, if any;
- b) Height and width of the shutter;
- c) Type of roller mechanism; and
- d) Date of manufacture.

7.2.1 The product may also be marked with Standard mark.

7.3 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 details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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