IS 12867 (1989): PVC Handrail Covers - Specification [CED 15: Builder Hardware]

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REAFFIRMED 2010

IS 12867 : 1989

Indian Standard

PVC HANDRAIL COVERS — SPECIFICATION

भारतीय मानक

सीढ़ियों पर हाथ रखकर चढ़ने-उतरने की पी० वी० सी० पटरियों के कवर

(हैन्डरेल) — विशिष्टि

UDC 692·633 [678·743·22]

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

June 1990

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AMENDMENT NO. 1 JANUARY 2008
TO
IS 12867 : 1989 PVC HANDRAIL COVERS — SPECIFICATION

(*Page* 1, *Table* 1, *col* 2) — Substitute the tolerances of '*A*' against sizes 25 mm, 40 mm, 50 mm, and 65 mm as '$+\ ^{2}_{0}$' *for* '± 1'.

(CED 15)

Reprography Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 30 November 1989, after the draft finalized by the Builders Hardware Sectional Committee had been approved by the Civil Engineering Division Council.

Handrails are provided along staircases and balconies. These have been conventionally covered with wood or aluminium. PVC handrail covers have been introduced and are in use now for more than two decades in the country. The advantages of PVC as material for handrails include; design flexibility, availability in desired colours, and ease of installation, besides its availability in longer lengths. Moreover PVC handrails are practically maintenace free.

Since PVC handrail covers in various colours, these are recommended for use depending upon their location-outdoor or indoor. Normally bright colours other than black fade in course of time when installed exposed to outdoor weather. Only black colour PVC handrail cover is recommended for outdoor exposed use.

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

PVC HANDRAIL COVERS — SPECIFICATION

1 SCOPE

1.1 This standard covers the dimensions and requirements for PVC handrail covers for use on metal strip handrails.

2 REFERENCES

2.1 IS 8543 (Part 4/Section 1) : 1984 'Method of testing plastics: Part 4 Short term mechanical properties, Section 1 Determination of tensile properties' is necessary adjunct to this standard.

3 MATERIALS

3.1 Handrails covers are manufactured by extrusion using plasticized PVC compound of desired formulation and colour.

4 SIZES

4.1 PVC handrail covers are normally made available in widths to match the desired width of metal strip, suitably welded as part of the handrail, with a view to providing comfortable grip. The common sizes shall suit metallic flats of width 25 mm, 40 mm, 50 mm and 65 mm.

5 DIMENSIONS AND TOLERANCES

5.1 A typical cross-section of PVC handrail is given in Fig. 1 and dimensions and tolerances are given in Table 1.

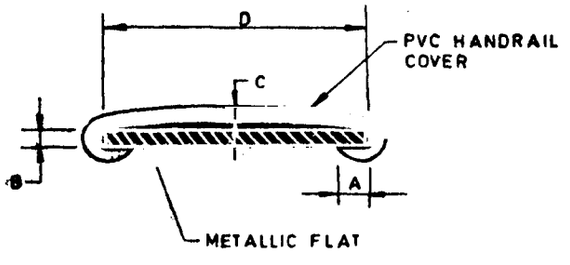

FIG. 1 TYPICAL CROSS-SECTION OF PVC HANDRAIL

5.2 The handrail covers should be supplied in overall lengths as agreed between purchaser and supplier. However for general use handrail covers should be supplied in 25 m lengths. The length of handrail covers supplied should not be less than specified.

6 TESTS

6.1 The handrail covers shall conform to the requirements given in Table 2.

Table 1 Dimensions and Tolerances of PVC Handrail Covers

(*Clause* 5.1)

All dimensions in millimetres.

Sizes	Dimensions			
	A	*B*	C *Min*	*D*
25	6 ± 1	5^{+1}_{-0}	3	$25 + 2$
40	7 ± 1	5^{+1}_{-0}	4	$40 + 2$
50	8 ± 1	5^{+1}_{-0}	4	$50 + 2$
65	9 ± 1	5^{+1}_{-0}	5	$65 + 2$

NOTE — Thickness *B* is given for metallic flat thickness of 5 mm. For 6 mm flats the thickness *B* shall be 6^{+1}_{-0} mm.

7 INSTALLATION

7.1 The method of installation of PVC handrail covers is given in Annex D.

8 MARKING

8.1 Each handrail covers shall be marked with the manufacturer's name or trade-mark on the body, either inside or outside as found convenient to the manufacturer.

8.1.1 Each handrail cover may also be marked with the standard mark by embossing at intervals of not more than 3 m. Marking shall be made on the body of the handrails.

9 PACKING

9.1 The handrail covers are wrapped in polyethylene sheeting and then packing in gunny cloth/woven polyethylene fabric. These bundles are tied tightly by plastic strappings in two orthogonal directions. Each bundle shall indicate manufacturers name or trade-mark, size of handrail cover colour and length.

10 STORAGE

10.1 The material shall be stored with bundle, lying flat and height of bundle not exceeding 2·5 m. Heavy material should not be placed on top of the bundles. Sharp and metallic objects should not be allowed to scratch the surface of handrail cover. These precautions should also be followed during transport of handrail.

Table 2 Requirements of PVC Handrail Covers
(Clause 6.1)

Sl No (1)	Characteristics (2)	Requirements (3)	Methods of Test (4)
i)	Heat ageing and exudation	No exudation of plasticizer shall be apparent nor shall there be any change in appearance.	*Annex A*
ii)	Tensile strength test	Tensile strength shall not be less than 10 N/mm²	IS 8543 (Part 4/Section 1) : 1984
iii)	Elongation	Minimum elongation shall be 115 percent	IS 8543 (Part 4/Section 1) : 1984
iv)	Hardness	Minimum value of Rockwall Hardness Number shall be L 65.	*Annex B*
v)	Resistance to combustion	The specimen shall not burn to the 25 mm mark and shall not show any flame or after glow after 5 seconds after the burner has been removed.	*Annex C*

ANNEX A
[*Table* 2, *Item* (i)]

METHOD OF TEST FOR HEAT AGEING AND EXUDATION

A-1 OBJECT

A-1.1 To determine the quality of PVC after ageing.

A-2 APPARATUS

A-2.1 A circulating air oven capable of maintaining a temperature of 70 ± 1°C and a 25 mm diameter mandrel.

A-3 PROCEDURE

A-3.1 The test specimen shall be a strip of the 25 mm wide and 225 mm long and shall be maintained at a temperature of 70 ± 1°C in the circulating air oven for 15 days. At the end of this time the specimen shall be removed from the oven, and then allowed to cool. After a further period of 60 minutes at 27 ± 2°C the specimen shall be examined for exudation by lightly rubbing the wearing surface with a clean white filter paper. A greasy stain on the paper shows that exudation has occurred and constitute a failure of the test.

ANNEX B
[*Table* 2, *Item* (iv)]

TEST FOR SURFACE HARDNESS

B-1 OBJECT

B-1.1 The object of the surface hardness test is to ensure that the surface of handrail is able to resist unacceptable indentation.

B-2 APPARATUS

B-2.1 Rockwell Hardness Tester

Having an L scale indentor, a diameter of 6·330 ± 0·002 5 mm and an effective major load of 588·4 N.

B-3 PROCEDURE

B-3.1 Condition the sample for 24 hours at a temperature of 27 ± 2°C and a relative humidity of 65 ± 5 percent. Bring the indentor into the lightest possible contact with any appropriate flat part of the handrail but not within 6 mm of the edge or previous indentations and always on the same face of the specimen as any previous indentations. Apply the 'minor' load of 98·1 N which operates when the small pointer is at zero and large pointer is within 5 ± 5 divisions of the 830 or 'set' position on the red scale. Within 10 seconds, apply the major load by operating the trip lever. Remove the major load 15 ± 1·0 seconds after its application. Read 15 seconds after removing the major load, to the nearest full division, the Rockwell hardness on the red scale.

B-3.2 Repeat the test five times, on the surface of handrail.

B-4 REPORTING

B-4.1 Calculate the average of the six readings.

ANNEX C
[*Table* 2, *Item* (v)]

METHOD OF TEST FOR RESISTANCE TO COMBUSTION

C-1 The object of this test is to check that the material of the conduit neither supports combustion nor easily ignites when heated in a flame.

C-2 TEST SPECIMEN

C-2.1 A line shall be drawn across the specimen at 25 mm from one end.

C-3 PROCEDURE

C-3.1 The specimen shall be tested in a drought-free atmosphere.

C-3.2 The specimen shall be clamped in a rigid support at its unmarked and so that its longitudinal axis is horizontal and the line drawn as in **C-2.1** is clearly visible.

C-3.3 A piece, 125 mm square, of clean wire gauze having 6 meshes/cm shall be clamped in the horizontal position 6·5 mm below the specimen with 6·5 mm of the unsupported end of the specimen projecting beyond the end of the gauze. An alcohol lamp or Bunsen burner, with a nonluminous flame 12·5 mm to 20 mm in height, shall be placed under the free edge of the specimen so that the top of the flame just touches it.

The intensity of the flame shall be tested as follows:

A bare copper wire, 0·71 mm in diameter and having a free length not less than 100 mm, shall be inserted in the flame 50 mm above the top of the burner. If the wire takes more than 6 seconds to melt, it is an indication that the burner is not working satisfactorily for the purpose of the test.

The flame shall be removed after 10 seconds and the specimen shall not continue to burn more than 5 seconds if the specimen is ignited.

ANNEX D
(*Clause* 7.1)

INSTALLATION OF PVC HANDRAIL COVERS

D-1 The handrail-railings with suitable metallic flat support of desired width and thickness are required for receiving the PVC handrail covers of matching dimensions. Care should be taken that the MS flat welded over the railings is flat and uniform/smooth.

D-2 The PVC handrail-cover is suitably heated with (blow lamp) on the inside face uniformly at a temperature of 80°C approximately, till it softens and becomes flexible. Then mount one edge of the handrail on the metal runner of the railing and by an outward movement of the hand, stretch out the other end of the handrail and fit it over the other end of the metal runner. The handrail cover should then be wrapped tightly with a cloth bandages continuously so as to make it hug the metal runner. The handrail is ready for use on its cooling.

D-3 Fixing of the PVC handrail cover is advised from the top of the staircase, and carried downward. Overheating of the PVC handrail cover is avoided, or else it will deform itself into design not acceptable by the MS flat support.

D-4 When heated the handrail cover tends to stretch. After fixing the handrail cover should not be out off flush with the end of the support. A margin of 20-30 mm is allowed for contraction, when uniformly cool, the extra portion of handrail can be cut of the edges and a flat piece of PVC can be welded to form a covering cap. The joint should be made smooth on cooling.

D-5 The ends of two pieces could be suitably welded when required. The end to be joined are pressed against a hot metal plate to permit softening of the PVC material and the metal plate is withdrawn downward while keeping the handrail ends pressed against each other till the joint cools down. The excess material visible on the surface of the joint is trimmed off with a sharp knife or blade and later the joint surface is filled with a rought file, and finished with sand paper. In case of any damage to the handrail in use, similar process is repeated.

D-6 After installation, removal of weld marks and scratches, etc, the handrail cover should be cleaned with a rag soaked in quick drying solvent such as methylene chloride or methyl-ethyl ketone without applying any pressure. Polishing with colourless wax polish is also recommended. Periodical cleaning with rag soaked in solution of good quality soap of detergent will help remove dirt-stains and grease marks.

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Doc : No. CED 15 (4539)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at Swatantra Bharat Press, Delhi, India