IS 15380 (2003): Moulded Raised High Density Fibre (HDF) Panel Doors - [CED 11: Doors, Windows and Shutter]

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IS 15380 : 2003

Reaffirmed 2008

भारतीय मानक

रंचकित, उठे हुए, उच्च घनत्व फाइबर (एच डी एफ) के दरवाजों के पल्ले — विशिष्टि

Indian Standard

MOULDED RAISED HIGH DENSITY FIBRE (HDF) PANEL DOORS — SPECIFICATION

ICS 79.060.20;91.060.50

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

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Price Group 4

AMENDMENT NO. 1 APRIL 2007
TO
IS 15380 : 2003 MOULDED RAISED HIGH DENSITY FIBRE (HDF) PANEL DOORS — SPECIFICATION

(*Page* 6, *clause* 14) — Insert '**ADDITIONAL**' before the title.

(CED 11)

Reprography Unit, BIS, New Delhi, India

Doors, Windows and Shutters Sectional Committee, CED 11

FOREWORD

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

Moulded raised high density fibre panel doors are being used in the country on a very large scale now. This standard has been developed keeping in view the practices prevailing in the country.

A scheme of labelling environment friendly products to be known as ECO-Mark is being introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 21 February 1991 published in the Gazette of the Government of India. For a product to be eligible for ECO-Mark, it shall also carry the Standard Mark of the BIS besides meeting additional optional environment friendly requirements.

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

MOULDED RAISED HIGH DENSITY FIBRE (HDF) PANEL DOORS — SPECIFICATION

1 SCOPE

This standard lays down requirements regarding types, sizes, material, construction, workmanship and finish and tests for high density fibre (HDF) panel doors.

2 REFERENCES

The standards given in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subjected to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given in Annex A.

3 TERMINOLOGY

3.0 For the purpose of this standard, the definitions given in IS 10428 , IS 707 and the following shall apply.

3.1 Raised Panel — Pre-primed, high density fibreboard, with deep moulded raised panel designs and with wood grains etched on the panel. Typical two, four and six panel designs are shown in Fig. 1 for information only. The number of panels on the face and the design are as agreed to between the purchaser and the supplier. Typical moulded raised HDF door is shown in Fig. 2 for information.

4 TYPES

Door shutters shall be of following two types:

a) *Heavy Duty* — having void area less than 35 percent, and

b) *Light Duty* — having void area not exceeding 65 percent .

5 SIZES

5.1 Sizes of the door shutters shall generally conform to the sizes given in Table 1. Other sizes, that is, width and height, as agreed to between the manufacturer and the purchaser, are also permitted provided they are in modules of 5 mm.

5.2 The nominal thickness of the shutters shall be 30 mm, 35 mm and 40 mm.

6 MATERIAL

6.1 Timber

6.1.1 Any species of timber having minimum bulk density of 450 kg/m^3 at 12 percent moisture content may be used for rails, stiles and core fillings of door shutters.

Table 1 Dimensions of Door Shutters

(*Clause* 5.1)

Sl No.	Width mm	Height	
		Option 1 mm	Option 2 mm
(1)	(2)	(3)	(4)
i)	700	2 005	—
ii)	700	2 045	2 070
iii)	800	2 045	2 070
iv)	900	2 045	2 070
v)	1 000	2 045	2 070
vi)	1 000	2 045	2 070

6.1.2 The moisture content in timbers used in the manufacture of door shutters shall be not more than 12 percent when tested according to IS 1708 (Part 1).

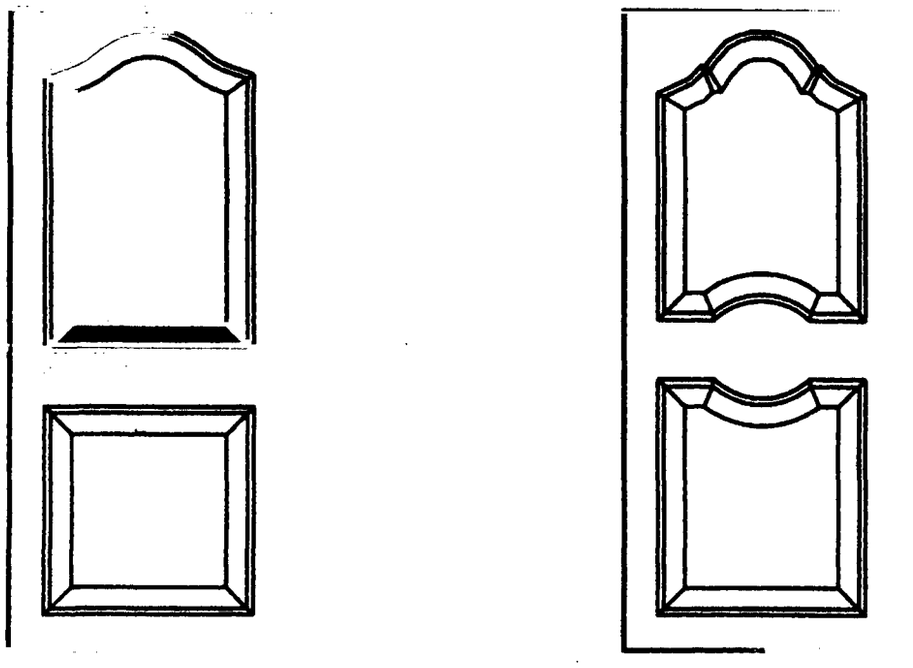
6.1.3 Timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members in which they occur may be permitted. Pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members.

6.1.4 Timber shall be preservative treated before assembly as given in **6.1.4.1**.

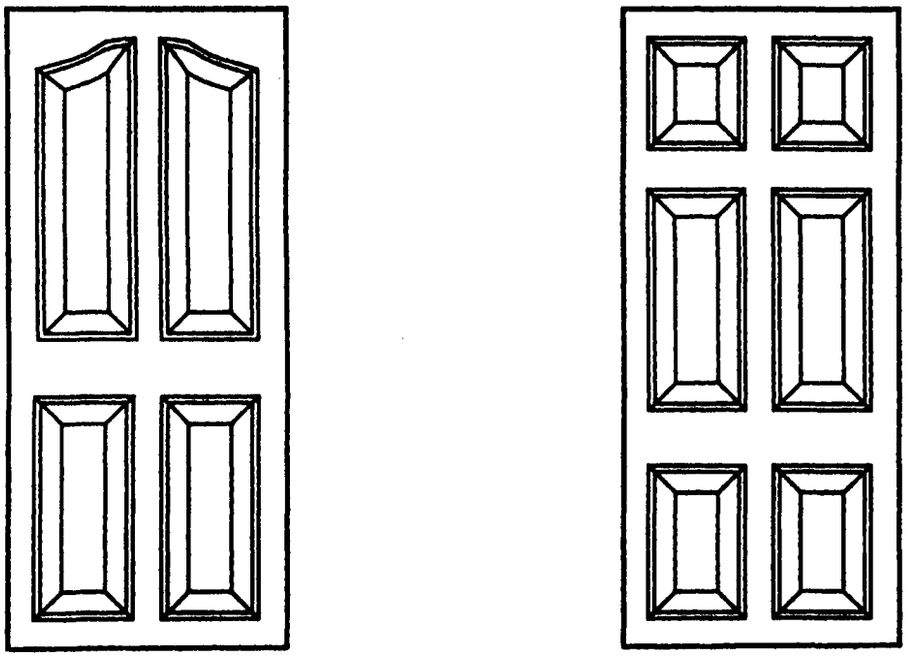
6.1.4.1 For preservative treatment, the timber shall be soaked in 1.25 percent solution of boric acid or 1.9 percent solution of borax at a temperature of 85°C to 90°C for a period of 10 min to 40 min depending upon the species and thickness or the timber may be dipped in a 2 to 3 percent solution of boric acid or 3 percent of borax for 2 min and then block stacked for at least 2 h before drying. Alternatively it may be soaked at ambient temperature in a 2 percent solution of sodium penta chlorophenate in water for a period of 2 min and then stacked for at least half an hour before drying. Timber should be dried to less than 12 percent moisture content. Qualitative test shall be conducted for determining the presence of preservative used.

6.2 Raised Fibreboard Skin

Raised fibre board skin used in door shutters shall be



1A Two Panel Doors



1B Four Panel Doors

1C Six Panel Doors

FIG. 1 TYPICAL DESIGN OF 2, 4 AND 6 PANEL DOORS

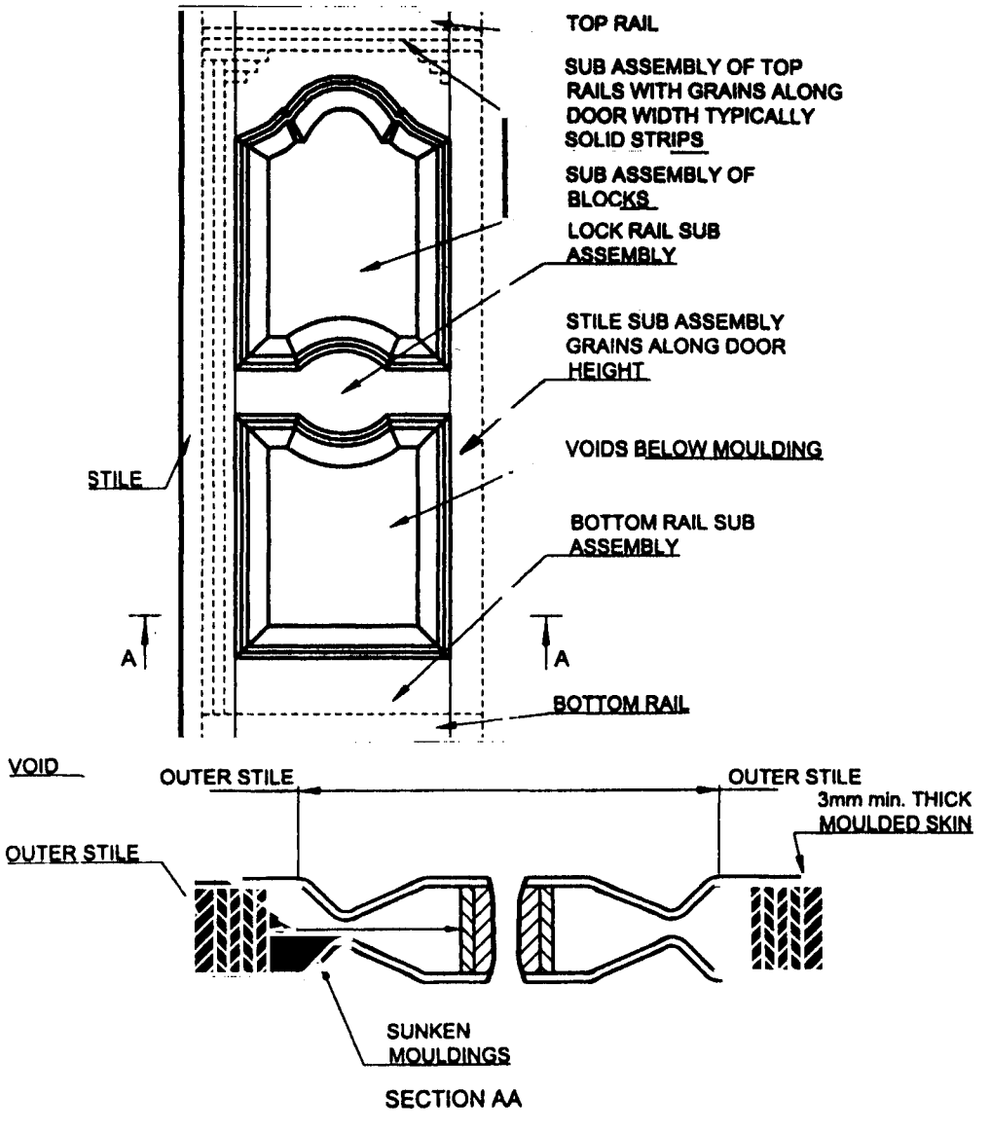


FIG. 2 TYPICAL MOULDED RAISED HDF PANEL DOOR

of minimum thickness 3 mm of phenolic bonded high density fibre board conforming to the requirement given in Table 2.

6.3 Adhesive

Adhesive used for bonding the face skins and core shall be phenol formaldehyde synthetic resin adhesive conforming to BWP grade of IS 848.

7 CONSTRUCTION

7.1 Heavy Duty

A frame consisting of stiles and rails of minimum width 45 mm and maximum width of 75 mm shall be provided. Stiles and rails shall be made of one species only without any joint. The joints may be permitted on the rails and stiles but only vertically so far as the extreme member is of minimum width 40 mm and is in a single piece. Below the raised panels, there shall be a sub-assembly of blocks and/or strips of wood, preferably from one species or different species having similar physical-mechanical properties, jointed or laid side by side in the void space to form a structurally integral raised panel after pressing. Wooden strips shall be cut from treated timbers seasoned to a moisture content less than 12 percent. Width of each strip of wood shall not exceed 50 mm. These strips may consist of pieces of small lengths placed end to end with end joints staggered. The thickness of sub-assemblies shall be such that after pressing the final specified thickness is attained.

7.2 Light Duty

A frame consisting of stiles and rails of minimum width

45 mm and maximum width of 75 mm shall be provided. Stiles and rails shall be made of one species only without any joint. The joints may be permitted on the rails and stiles but only vertically so far as the extreme member is of minimum width 40 mm and is in a single piece. Below the raised panels, there shall be a sub-assembly of blocks and/or strips of wood with voids not exceeding 65 percent to form a structurally integral raised panel after pressing. In case light wooden strips are used leaving void spaces in between or in combination with any synthetic material or paper products, they shall be cut from treated timber seasoned to a moisture content less than 12 percent. The thickness of sub-assemblies shall be such that after pressing the final specified thickness is attained.

7.3 Empanelment

Raised panel fibreboard skin shall be glued on either side of the sub-assembly using synthetic resin adhesive (*see* 6.3) and pressed under heat and pressure.

7.4 Lipping

Lipping shall be provided, if so desired by the purchaser. Lipping where provided may be internal or external as specified by the purchaser. Joints shall not be permitted in the lipping. External lipping shall be solid and shall measure at least 6 mm on the face of the door.

7.5 Rebating

In the case of double leaved shutters, the meeting of the stiles shall be rebated by 8 mm to 10 mm. The rebating shall be either splayed or square type. Where lipping is provided, the depth of lipping at the meeting of stiles shall not be less than 30 mm.

7.6 Opening for Glazing

Glazing may be provided as required by the purchaser, by cutting out panels. Internal structure and the handing for affixing panel shall be as agreed to between the purchaser and the manufacturer.

8 FITTINGS

8.1 Locks

Shutters shall be shop prepared for taking any suitable type of locks or latches as may be agreed to between the manufacturer and the purchaser. Shop preparing the door with morticed holes for lock fixing shall be done only when desired by the purchaser.

8.1.1 Other fittings such as pull bolt, etc, shall be

Table 2 Requirements for Raised Panel Fibreboard Skins

(*Clause* 6.2)

Sl No.	Requirements	Permissible Limits	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Density, kg/m^3	> 1 000	2380 (Part 3)
ii)	Moisture content, percent, *Max*	8	2380 (Part 3)
iii)	Water absorption, percent:		2380 (Part 16)
	After 2 h	< 16	
	After 24 h	< 36	
iv)	Swelling in water, percent, *Max*		2380 (Part 17)
	a) General absorption, 24 h:		
	1) Thickness	20	
	2) Length	0.70	
	3) Width	0.70	
	b) Surface absorption	9	
v)	Modulus of rupture, N/mm^2 *Min*	35	2380 (Part 4)
vi)	Internal bond strength, N/mm^2 *Min*:		2380 (Part 5)
	a) Dry state	1.0	
	b) Wet state (2 h boiling)	0.3	
vii)	Immersion in boiling water at 100 ± 3°C for 4 h	No Disintegration	
viii)	Formaldehyde emission	< 9 mg/100 g	13745

provided as agreed to between the purchaser and the manufacturer.

9 WORKMANSHIP AND FINISH

9.1 All the four edges of the door shutter shall be square. The shutter shall be free from twist or warp in its plane.

9.2 The surface of the shutter shall be pre-primed. The shutter may be supplied either in textured or smooth surface finish as agreed to between the purchaser and the manufacturer.

10 TESTS

10.1 Classification of Tests

10.1.1 *Acceptance Tests*

The following tests shall constitute product acceptance tests:

a) Dimensions and squareness test,
b) General flatness test,
c) Local planeness test,
d) End immersion test,
e) Glue adhesion test, and
f) Slamming test.

10.1.2 *Type Tests*

The following tests shall constitute product approval type tests:

a) Impact indentation test,
b) Flexure test,
c) Edge loading test,
d) Buckling test,
e) Shock resistance test:
   1) Soft and light body impact test,
   2) Soft and heavy body impact test,
f) Misuse test,
g) Screw withdrawal resistance test, and
h) Varying humidity test.

11 REQUIREMENTS

11.1 Dimensions and Squareness Test

Door shutters, when tested in accordance with IS 4020 (Part 2) the dimensions of the nominal width and height shall be within a limit of + 5 and – 0 mm. The door shutter shall not deviate by more than 1 mm on a length of 500 mm. The thickness of the door shutter shall be uniform throughout with the permissible variation of not more than 0.8 mm between any 2 points. The nominal thickness of the shutter shall be within a limit of ± 1 mm.

11.2 General Flatness Test

Door shutters when tested in accordance with IS 4020 (Part 3) the twist, cupping and warping shall not exceed 6 mm.

11.3 Local Planeness Test

Door shutters when tested in accordance with IS 4020 (Part 4) the depth of deviation measured at any point shall not be more than 0.5 mm. Measurement should be taken in a way to avoid the areas etched for simulated grain effect.

11.4 Impact Indentation Test

Door shutters when tested in accordance with IS 4020 (Part 5) on the flat part of the empanelment shall have no defects cracking, tearing or delamination and the depth of indentation shall not be more than 0.2 mm.

11.5 Flexure Test

Door shutters when tested in accordance with IS 4020 (Part 6) the deflection at the maximum load shall not be more than one-thirtieth of the length and one-fifteenth of the width, whichever is less. On removal of the loads, the residual deflection shall not be more than one-tenth of the maximum deflection.

11.6 Edge Loading Test

Door shutters when tested in accordance with IS 4020 (Part 7) the deflection of the edge at the maximum load shall not be more than 5 mm. On removal of the loads, the residual deflection shall not be more than 0.5 mm, failing which the test may be repeated on the other edge in the reverse direction. Also there shall be no lateral buckling by more than 2 mm during loaded condition and no residual lateral buckling after removal of the load.

11.7 Shock Resistance Test

Door shutters when tested in accordance with IS 4020 (Part 8) for soft and light body impact, there shall be no visible damage in any part of the door after fifteen blows. When tested for soft and heavy body impact, the normally hung door with hangings, fixings and fastenings should withstand without any significant permanent deformation and without deterioration the five impacts.

11.8 Buckling Test

Door shutters when tested in accordance with IS 4020 (Part 9) shall not show any deterioration and any residual deformation more than 5 mm after 15 min of unloading and initial deflection also shall not be more than 50 mm.

11.9 Slamming Test

Door shutters when tested in accordance with IS 4020 (Part 10) shall not have any visible damage in any part of the door at the end of 100 successive impacts in the horizontal position.

11.10 Misuse Test

Door shutters when tested in accordance with IS 4020 (Part 11) there shall not be any permanent deformation of the fixing or any other part of the door set in hindering its normal working after the test.

11.11 Varying Humidity Test

Door shutters when tested in accordance with IS 4020 (Part 12) there shall not be any visible warping, twisting or delamination and where precision is required the maximum departure from the general planeness shall not be more than 1.0 mm. The maximum increase of the size at the high humidity percent and the recovery to the original size of the door again at the lower humidity shall be at least 90 percent.

11.12 End Immersion Test

Door shutters when tested in accordance with IS 4020 (Part 13) shall have no delamination at the end of the test.

11.13 Glue Adhesion Test

Door shutters when tested in accordance with IS 4020 (Part 15) shall be considered to have passed the test if no delamination has occurred in the glue lines or if no single delamination of more than 50 mm in length and more than 3 mm in depth has occurred in the assembly glue lines between the face skins and sub-assemblies. The empanelment is examined for decomposition. A door shutter shall be deemed to have passed the test if both the specimens tested passed the test. The panel shall not disintegrate at the end of the test.

11.14 Screw Withdrawal Resistance Test

Door shutters when tested in accordance with IS 4020 (Part 16), the required load to withdraw the screw completely shall not be less than 1 000 N. On withdrawal there shall be no visible damage to the surface either by delamination or extra chipping off at the points of withdrawal.

12 SAMPLING AND CRITERIA FOR CONFORMITY

12.1 In any consignment all the shutters of the same type and manufactured under similar conditions of production shall be grouped together to constitute a lot.

12.2 Sample Size

The number of specimens to be taken for testing of shutters for dimensions and squareness, general flatness and local planeness tests shall be in accordance with col 3 of the Table 3. For end immersion test, glue adhesion test and slamming test the number of specimens to be taken for testing shall be in accordance with col 5 of Table 3. Type tests shall be carried out twice in a year and whenever the design and construction is changed.

13 CRITERIA FOR CONFORMITY

The lot shall be declared as conforming to the requirements of the standard when the number of defective samples does not exceed the permissible number given in col 4 of Table 3.

14 REQUIREMENTS FOR ECO-MARK

Door shutters shall be manufactured using wood from sources other than natural forests such as timber from industrial and social forestry plantations, shade trees from tea and coffee estates etc, as applicable to various components under 6 and such door shutters shall conform to the requirements of quality and performance as specified in this standard as well as the requirements of ECO-Mark for all the referred standards.

NOTES

1 The manufacturers shall provide documentary evidence by way of certificate or declaration to Bureau of Indian Standards while applying for ECO-Mark.

2 The manufacturers shall produce to BIS environmental consent clearance from the concerned State Pollution Control Board as per the provisions of the *Water (Prevention and Control*

Table 3 Sample Size and Criteria for Conformity

(*Clauses* 12.2 *and* 13)

Sl No.	Lot Size	Sample Size	Permissible No. of Defectives	Sub-sample Size
(1)	(2)	(3)	(4)	(5)
i)	1 to 50	8	0	1
ii)	51 to 100	13	1	2
iii)	101 to 150	20	1	2
iv)	151 to 300	32	1	3
v)	301 to 500	50	2	4
vi)	501and above	80	2	5

of Pollution) Act, 1974 and *Air (Prevention and Control of Pollution) Act*, 1981 along with the authorization, if required under the *Environment (Protection) Act*, 1986, while applying for ECO-Mark.

15 MARKING

15.1 Each door shutter shall be legibly and indelibly marked on any of its edges with the following information:

a) Name of the manufacturer or trade-mark, if any;

b) Abbreviation indicating the nature of construction that is, heavy duty (HD) or light duty (LD);

c) Whether the size of the door shutter is 'modular' or 'non-modular';

d) Designation as specified for modular sizes or the actual size (width and height) for non-modular sizes;

e) Thickness of the door shutter;

f) Species of timber, in case of ECO-Mark; and

g) Criteria for which the product has been labelled as ECO-Mark.

15.2 The door shutter may also be marked with the Standard Mark.

15.2.1 The use of Standard Mark is governed by the provision 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 the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A
(*Clause* 2)

IS No.	*Title*
707 : 1976	Glossary of terms applicable to timber technology and utilization
848 : 1974	Synthetic resin adhesive for ply-wood (phenolic and amino plastic)
1708 (Part 1) : 1986	Method of testing of small clear specimens of timber: Part 1 Determination of moisture content
2380	Method of test for wood particle boards and boards from other lignocellulosic materials:
(Part 3) : 1977	Determination of moisture content and density
(Part 4) : 1977	Determination of static bonding strength
(Part 5) : 1977	Determination of tensile strength perpendicular to surface
(Part 16) : 1977	Determination of water absorption
(Part 17) : 1977	Determination of swelling in water
4020	Door shutters — Methods of test:
(Part 2) : 1998	Measurement of dimensions and squareness
(Part 3) : 1998	Measurement of general flatness
(Part 4) : 1998	Local planeness test
(Part 5) : 1998	Impact indentation test
(Part 6) : 1998	Flexure test
(Part 7) : 1998	Edge loading test
(Part 8) : 1998	Shock resistance test
(Part 9) : 1998	Buckling resistance test
(Part 10) : 1998	Slamming test
(Part 11) : 1998	Misuse test
(Part 12) : 1998	Varying humidity test
(Part 13) : 1998	End immersion test
(Part 15) : 1998	Glue adhesion test
(Part 16) : 1998	Screw withdrawal resistance test
10428 : 1983	Glossary of terms relating to doors
13745 : 1993	Method for determination of formaldehyde content in particle board by extraction method called perforator method

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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 from Doc: No. CED 11 (6051).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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