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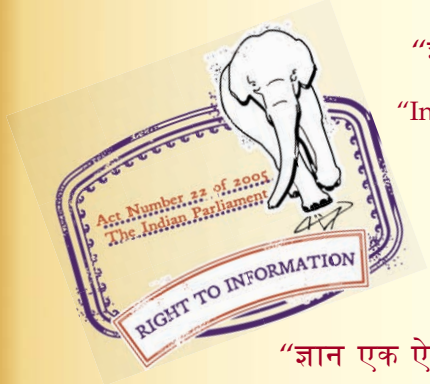
IS 4021 (1995): Timber Door, Window and Ventilator Frames - [CED 11: Doors, Windows and Shutter]



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IS 4021 : 1995

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(तीसरा पुनरीक्षण)

Indian Standard

TIMBER DOOR, WINDOW AND VENTILATOR FRAMES — SPECIFICATION

(Third Revision)

First Reprint SEPTEMBER 1999

UDC 694·6 : 692·81/·82

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN. 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 11002

March 1995

Price Group 7

AMENDMENT NO. 1 AUGUST 2000
TO
IS 4021 : 1995 TIMBER DOOR, WINDOW AND VENTILATOR FRAMES — SPECIFICATION

(Third Revision)

(*Second cover page, foreword*) — Insert the following new para after the fifth para:

'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.'

(*Page* 9, *clause* 10) — Insert the following new clause after 9 and renumber the subsequent clauses:

'10 REQUIREMENTS FOR ECO MARK

10.1 Door shutters shall be manufactured from agricultural or industrial wastes or wood residues or wood from sources other than natural forests such as timber from industrial and social forestry plantations, shade tree from tea and coffee estate etc, as specified in IS 12896 : 1990 and such doors 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 of Pollution) Act*, 1974 and *Air (Prevention and Control of Pollution) Act*, 1981 alongwith the authorization, if required under the *Environment (Protection) Act*, 1986, while applying for ECO Mark.'

(*Page* 9, *renumbered clause* **11**) — Insert the following at the end of the clause:

'd) Species of timber, in case of ECO Mark; and

e) The criteria for which the product has been labelled as ECO Mark.'

(CED 11)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 MAY 2009
TO
IS 4021 : 1995 TIMBER DOOR, WINDOW AND VENTILATOR FRAMES — SPECIFICATION

(Third Revision)

(*Second cover page*, *Foreword*, *third para*) — Insert 'as given in Annex B' between 'list' and 'has' in the ninth line.

(*Page* 2, *clause* **4.1.3**, *eighth line*) — Substitute 'IS 401 : 2001' *for* 'IS 401 : 1982'.

(*Page* 6, *clause* **5.3**, *sixth line*) — Substitute 'IS 848 : 2006' *for* 'IS 848 : 1974'.

(*Page* 8, *clause* **7**) — Substitute '**METALLIC FASTENERS/HOLDFASTS**' *for* '**HOLDFASTS**' in the title and wherever appearing in the clause.

(*Page* 8, *clause* **8.3**) — Substitute 'IS 3536 : 1999' *for* 'IS 3536 : 1966'.

[*Page* 9, *clause* **10** (*see also Amendment No*. 1)] — Insert '**ADDITIONAL**' before the existing title.

(*Page* 10, *Annex* A) — Substitute the following for the existing, as appropriate:

'IS 401 : 2001	Code of practice for preservation of timber (*fourth revision*)
IS 848 : 2006	Synthetic resin adhesives for plywood (phenolic and aminoplastic) — Specification (*second revision*)
IS 3536:1999	Ready mixed paint, brushing, wood primer — Specification (*first revision*)'

(*Page* 11, *Annex* B) — Substitute the following matter appearing on page 2 for the existing:

ANNEX B

(*Foreword*, and *Clause* 4.1.1)

LIST OF SPECIES OF TIMBER BEING IMPORTED FOR FRAMES OF DOORS AND WINDOWS CONSIDERED SUITABLE FROM THE FOREIGN LITERATURE AVAILABLE

Sl No.	Trade Name	Botanical Name	Country from Where Imported
(1)	(2)	(3)	(4)
i)	Abura	*Mitragyna stipulosa*	Africa (A)
ii)	Afrormosia*	*Afrormosia angolensis*	(A)
iii)	Alan Batu†	*Shorea albida*	Malaysia (M)
iv)	Amoora†	*Ammore cucullata*	Papua New Guinea (PNG)
v)	Bitangor	*Calophyllum* spp.	(M)
vi)	Dark Red Meranti†	*Shorea* spp.	(M)
vii)	Durian	*Coelostegia* spp. *Duria* spp. and *Neesia* spp.	(M)
viii)	Iroko*	*Chlorophora excelsa*	(A)
ix)	Keuring	*Diapterocarpus* spp.	(M)
x)	Kwila†	*Instia bijuga*	(PNG)
xi)	Light Red Meranti†	*Shorea* spp.	(M)
xii)	Merawan†	*Hopea* spp.	(M)
xiii)	Merbau†	*Intsia palembanica*	(M)
xiv)	Nyatoh†	*Ganua* spp., *Palaquium* spp. and *Payuena* spp.	(M)
xv)	Nyatoh kuring†	*Planchonella* spp. and *Pouteria* spp.	(M)
xvi)	Sapela†	*Entandophragma cylindrium*	(A)
xvii)	Terminalia red brown group†	*Terminalia* spp.	(PNG)
xviii)	Utile†	*Entandophragma utile*	(A)
xix)	Vitex†	*Vitex cofassus*	(PNG)

NOTE — Above imported species shall be used for frames only after proper treatment as prescribed in IS 401 : 2001 and concerned clauses of this standard, as suitable and sufficient information regarding their durability is not available and whatever is available may not fully hold good in Indian conditions. However, heartwood of species marked '*' does not require treatment as the same is reported to be very durable. Further, where sufficient retention/absorption/penetration of preservative is not obtained as per IS 401 : 2001 due to poor treatability character of the species, the frame shall be treated with PCP solvent system after construction to ensure minimum penetration of preservative to the depth of 2 mm in the finished product by soaking in 5 % PCP solution for 24 h or pressure treatment. Such species which are refractory to treatment are marked '†'.'

(CED 11)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 NOVEMBER 2011
TO
IS 4021 : 1995 TIMBER DOOR, WINDOW AND VENTILATOR FRAMES — SPECIFICATION

(Third Revision)

(*Page* 2, *clause* **4.1.5**) — Insert the following new clause at the end:

'**4.2 Laminated Veneer Lumber**

Laminated veneer lumber used shall conform to IS 14616'.

(*Page* 4, *clause* **5.1**) — Insert the following at the beginning:

'The frames shall be manufactured from timber or laminated veneer lumber.'

(*Page* 8, *clause* **8.2**, *last line*) — Substitute 'IS 216 : 2006' *for* 'IS 216 : 1961'.

[*Page* 10, *Annex* A (*also see Amendment No.* 2)] — Substitute the following for the existing entry:

IS No.	*Title*
'216 : 2006	Coal tar pitch — Specification (*second revision*)'

[*Page* 10, *Annex* A (*also see Amendment No.* 2)] — Insert the following at the appropriate place:

IS No.	*Title*
'14616 : 1999	Laminated veneer lumber — Specification'

(CED 11)

Reprography Unit, BIS, New Delhi, India

FOREWORD

This Indian Standard (Third Revision) 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.

Doors and windows are essential elements in any type of buildings. Frames of doors and windows are most popularly made of wood on account of the aesthetics, versatility, availability and workability of wood There is an established production of these in factories equipped fully with kiln-seasoning and treatment plants.

All door and window frames are in contact with the walls of the opening; some are exposed to moisture/water at the bottom location embedded in flooring or walls In addition they have to carry the weight of the shutter plus whatever additional stress on the shutter that gets passed on to it. The screws of the hinges are the ones that attach the shutter to the frame. So frames in addition to some dimensional stability require resistance to decay or easy treatability, screw-holding and other relevant strength properties. Generally these properties increase with increase in the density. There is separate specification which rationally groups the species so that the buyer can choose a group suitable to him. As the country is now depending substantially on imported timbers, a list has been added to this specification listing the popular imported ones. These species have not been tested in our laboratories and so caution has to be exercised in their use.

This standard was first published in 1957 and revised in 1967 and 1983. In this revision changes have been brought about in giving the sectional sizes of frame separately for doors, windows and ventilators with a view to economize on timber without impairing the quality and strength and keeping in view the preferred sizes covered in IS 1331 : 1971. Mortice and tenon joints have been included now for frames in addition to dove tail joint.

Keeping in view the advantages of modular coordination, Indian Standard specifies the dimensions of components in terms of certain modules. In line with this, the dimensions of frames are also specified in modular units. In view of the demand of sizes other than modular sizes, this standard permits as per **6.2** non modular sizes also in addition to modular sizes. However, this relaxation has been made only in the height and width, the cross section remaining unchanged from the present provisions.

The Committee responsible for the preparation of this standard is given at Annex D.

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

TIMBER DOOR, WINDOW AND VENTILATOR FRAMES — SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard lays down the requirements regarding material, construction, workmanship and sizes of timber door, window and ventilator frames generally used in residential and institutional buildings.

1.2 This standard does not cover timber door, window and ventilator frames for commercial, industrial and other special buildings, such as workshops and garages.

2 REFERENCES

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

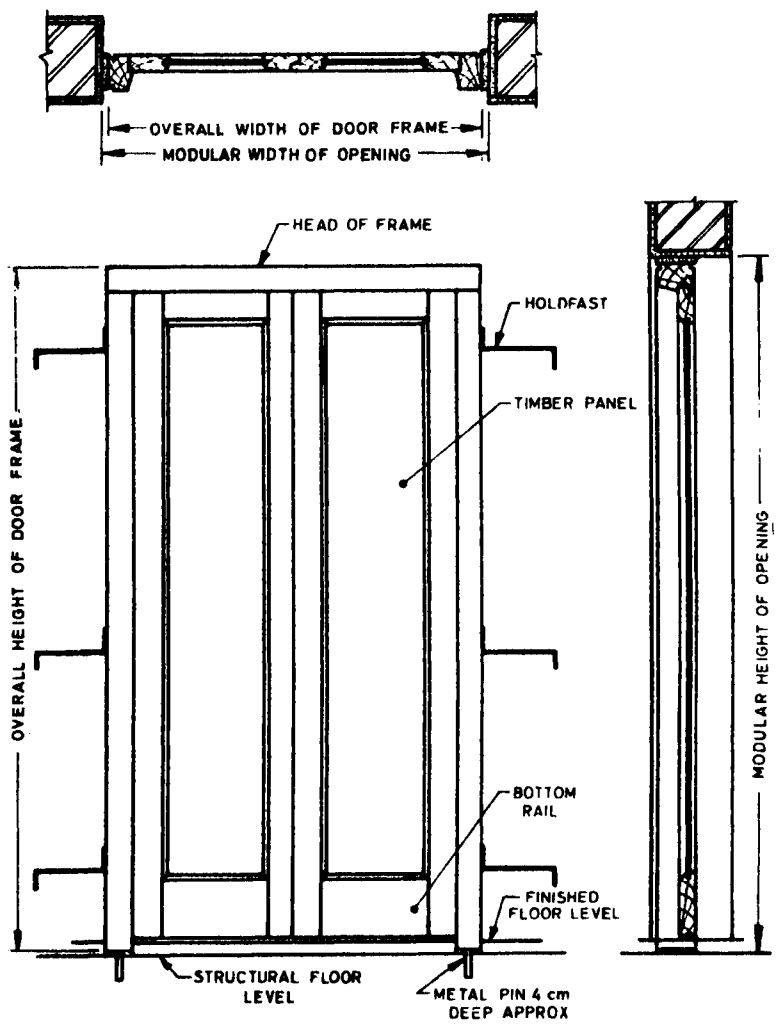
3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 10428 : 1983 and IS 707 : 1976 shall apply (*see* Fig. 1).

4 MATERIALS

4.1 Timber

4.1.1 Indian timbers suitable for the manufacture of door and window frames shall be in accordance with



1A Single Panelled Door

FIG. 1 TERMINOLOGY FOR TIMBER DOOR, WINDOW AND VENTILATOR COMPONENTS (*Contd*)

IS 12896 : 1990. Imported timbers, to be used are listed in Annex B. Door frames shall be made from all heart stock of a decay resistant species or of wood treated to make it decay-resistant. Vertical timber posts or head/sill of the frame shall be of the same species excepting in case of frames made out of non-porous wood (softwood) when the bottom sill of the window and the ventilator frame shall be of porous wood (hardwood).

4.1.2 *Moisture Content*

The maximum permissible moisture content in timber shall be as specified in IS 287 : 1993.

4.1.3 *Seasoning and Treatment*

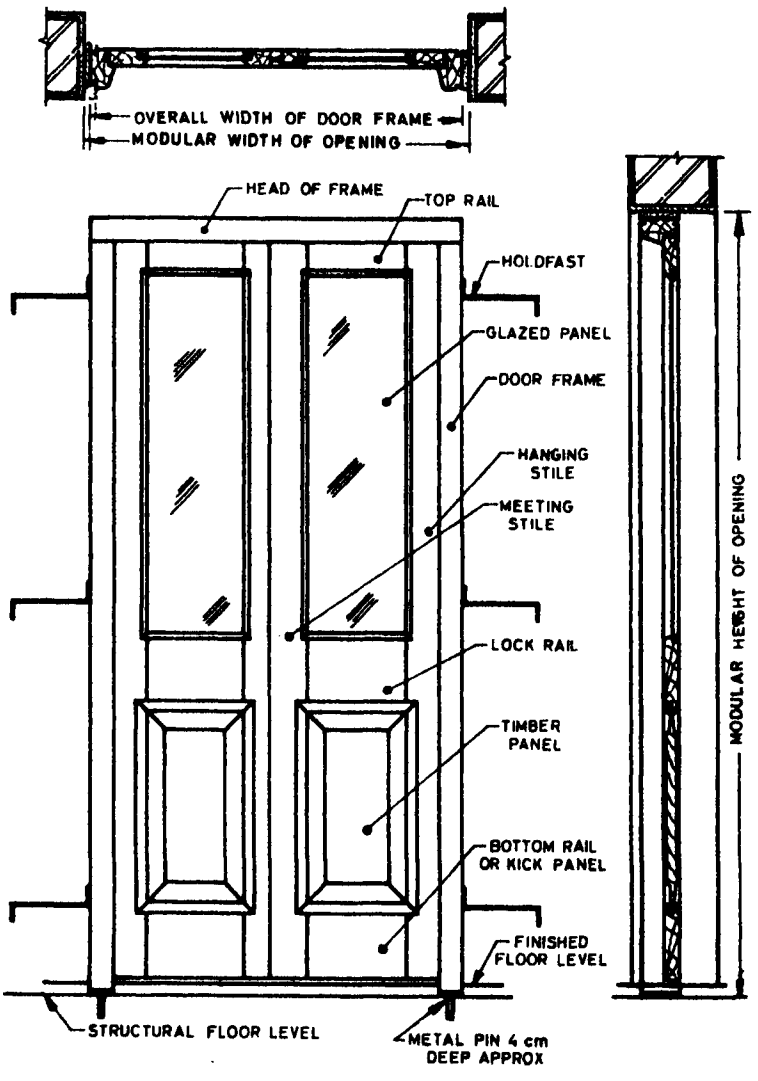
Timber shall be well seasoned by a suitable process conforming to IS 1141 : 1993, before being planed and shaped to the required dimensions. Sapwood of durable species and hardwood and sapwood of non-durable species shall be treated with suitable preservatives (except the water soluble leachable type) as specified in IS 401 : 1982. The portions expected to remain concealed in joinery or in masonry shall be given an additional coat of wood preservative.

4.1.4 *Defects Prohibited*

Timber for frames shall be free from decay, fungal growth, boxed heart, splits, pitch pocket or streaks on the exposed faces.

4.1.5 *Defects Permitted*

The timber shall be graded as First Grade or Second Grade on the basis of the permissible defects in timber as given in Table 1. For both the grades, knots shall not



1B Glazed and Panelled Door

FIG. 1 TERMINOLOGY FOR TIMBER DOOR, WINDOW AND VENTILATOR COMPONENTS (*Contd*)

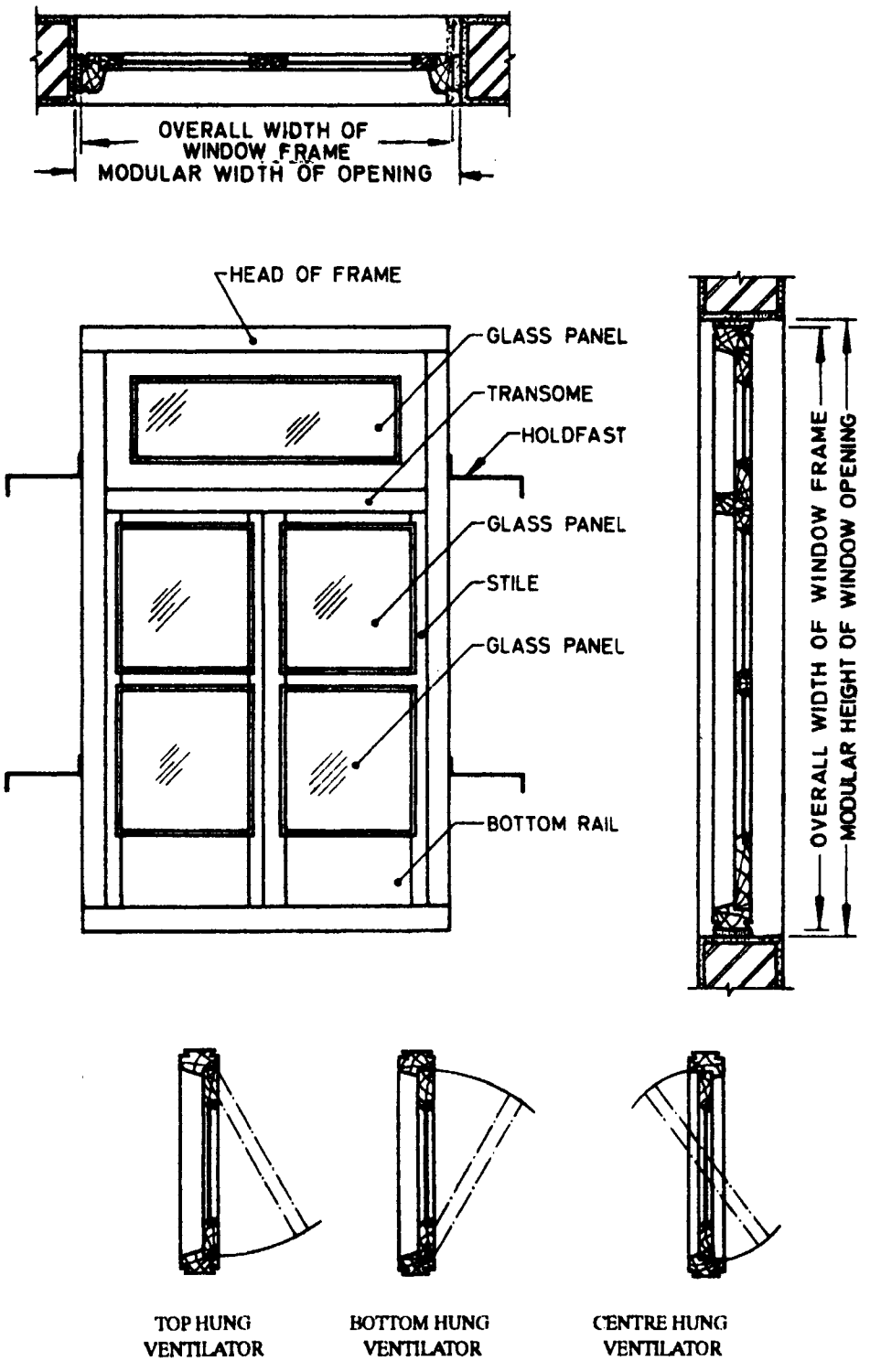


FIG. 1 TERMINOLOGY FOR TIMBER DOOR, WINDOW AND VENTILATOR COMPONENTS (*Contd*)

occur at joint or at locations where holdfasts/hinges are to be fixed.

5 CONSTRUCTION AND WORKMANSHIP

5.1 Timber shall be sawn in the direction of grain. Sawing shall be truly straight and square. The scantling shall be planed smooth and accurate to the full dimensions, rebates, etc, before assembly. The surface touching the walls may not be planed unless it is required to straighten up the member or to obtain the overall size within the specified tolerances. Patching or plugging of any kind shall not be permitted except as provided herein.

5.1.1 All members of frame shall be exactly at right angles. The right-angle shall be checked from the inside surfaces of the respective members.

5.1.2 All members of frame shall be straight without any warp or bow and shall have smooth, well-planed on three sides exposed at right angles to each other.

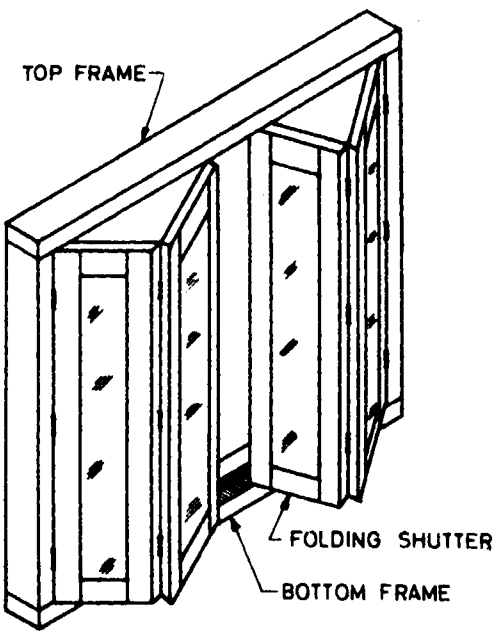
5.1.3 The depth of rebate in frame for housing the shutter shall in all cases be 15 mm except for small window and ventilator frames where it shall be 12 mm.

5.2 Joinery

5.2.1 Frames of timber doors, windows and ventilators shall be assembled by any of the following simple, neat and strong joints:

a) Single dovetail joint (Fig. 2),
b) Closed mortice and tenon joint (Fig. 3), and
c) Haunched mortice and tenon joint (Fig. 4).

5.2.1.1 Dovetail joint is formed at the corner of two pieces in such a way that the notch made on one is fitted exactly into projection of corresponding size and shape made in the other. This is a wedge shaped dovetail joint made in a way which will resist withdrawal except in the direction in which it was assembled (This joint is usually adopted when the frame is not built-in as the work proceeds).



1D Window with Folding Shutters

FIG. 1 TERMINOLOGY FOR TIMBER DOOR, WINDOW AND VENTILATOR COMPONENTS

Table 1 Permissible Defects for Various Grades of Timber

(*Clause* 4.1.5)

Sl No.	Defects	First Grade	Second Grade
(1)	(2)	(3)	(4)
i)	Cross grain	Not steeper than 1 in 15	Not steeper than 1 in 10
ii)	Sound knots and live knots a) Size, *Max* b) Number per metre	 20 mm 1	 35 mm 2
iii)	Decayed knots, dead knots and knots holes	Not more than 10 mm size centrally located and not more than 1 knot per metre. These shall be completely put out and tightly plugged with seasoned timber of the same species and properly glued, so that its grains run in the direction of main pieces	Not more than 10 mm size centrally located and not more than 2 knots per metre. These shall be completely put out and tightly plugged with seasoned timber of the same species and properly glued, so that its grains run in the direction of main pieces
iv)	Pitch pockets or streaks	None	Permissible except on exposed edges, provided they are clear and filled up with putty or filler. When these are located on exposed edges of the core, they shall be cut out and plugged with similar species of timber with grains running in the same direction as that of the pieces. The pieces shall be well glued
v)	Sapwood	Total not exceeding 5 mm wide and 150 mm long per metre (This restriction applies only to group 1 timbers)	Total not exceeding 10 mm wide and 300 mm long per metre (This restriction applies only to group 1 timbers)
vi)	Pin holes (other than due to live infestation)	Permitted provided they are not in clusters	Permitted
vii)	Worm holes	None	Permitted provided they are not more than 10 mm in diameter and not more than one per metre and provided such worm holes are plugged with similar timber in such a manner that the plugging merge with the surrounding area both as to colour and grains
viii)	Checks , depth, *Max*	3 mm, provided it is fully stopped	One-fourth of the total thickness of piece or 6 mm whichever is less, provided it is fully stopped

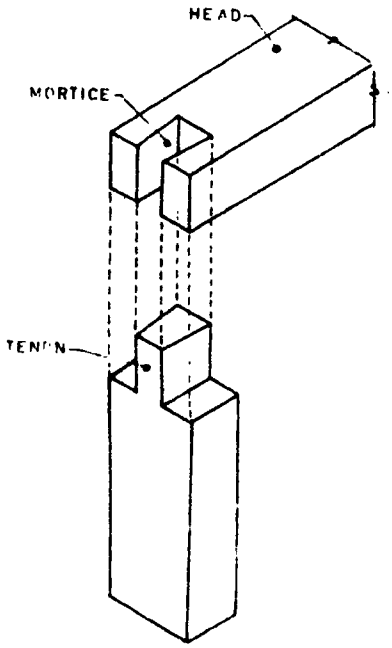


FIG. 2 SINGLE DOVE-TAIL JOINT

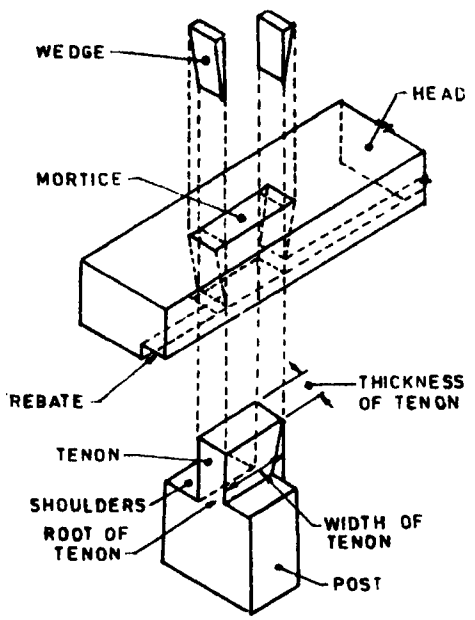


FIG. 3 CLOSED MORTICE AND TENON JOINT

5.2.1.2 For closed mortice and tenon joint the head is morticed to receive the tenon on the post. The mortice and tenon must be correctly proportioned. Thickness of tenon should be equal to 1/3 that of the member and width of tenon not exceeding five times the thickness. (In this case the head usually projects from 50 to 100 mm beyond the post and these projections called 'horns' assist in making the frame secure when it is built into the wall). Mortice and tenon joint shall fit in fully and accurately preferably without wedging or filling. The joints shall be glued, framed, put together and pinned with hardwood or bamboo pins not less than 8 mm dia after the frames are put together and pressed.

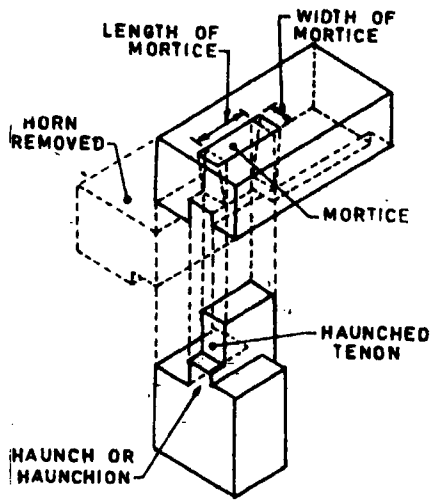


FIG. 4 HAUNCHED MORTICE AND TENON JOINT

5.2.1.3 Haunched mortice and tenon joint is adopted when the frame is not built-in as the work proceeds. Horns are not required (These are removed after wedging has been completed) and therefore width of tenon is reduced to facilitate wedging. This haunch increases the strength of tenon at its roots and prevents twisting of post. The joint shall however be glued.

5.2.1.4 Transome shall be tennoned to the frame.

5.2.1.5 In the case of door frames without sill, the vertical members (Posts) shall be held in position at specified distances by means of spacers, which may be removed after fixing of the frame in position.

5.3 Gluing of Joints

The contact faces of tenon and mortice shall be treated, before putting together, with bulk type synthetic adhesives conforming to IS 851 : 1978 suitable for construction work in wood or synthetic resin adhesive (Phenolic and aminoplastic) conforming to IS 848 : 1974 suitable for plywood or animal glue for general wood working purposes conforming to IS 852 : 1994 or polyvinyl acetate dispersion based adhesive for wood conforming to IS 4835 : 1979.

5.4 Fixing of Frame

The frame shall be fixed either during construction of wall (built-in) or after the wall has been completed. The frame shall be placed in proper position and secured to wall or column as the case may be with metallic fastener or iron hold-fasts. In case of door frame without sill, the vertical members shall be embedded in the flooring to

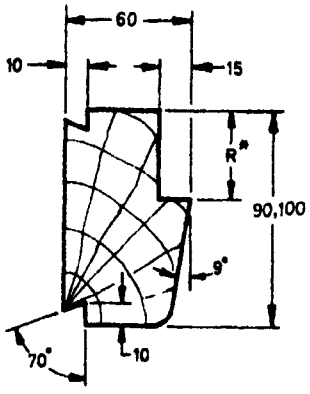
its full depth and preferably anchored with metal pin as shown in Fig. 1. It shall be suitably strutted or wedged in order to prevent warping during construction.

5.4.1 External wood-work shall be primed before being fixed.

6 DIMENSIONS, SIZES AND TOLERANCES

6.1 Dimensions of Frames and Tolerances

The finished dimensions of timber sections in frames for doors, windows and ventilators shall be as given in Table 2 (*see* Fig. 5, 6, 7 and 8) subject to a general tolerance of $^{+3}_{-0}$ mm for width and $^{+2}_{-3}$ mm for thickness.



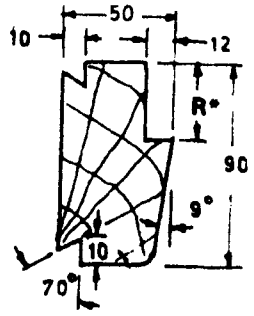
*R (Thickness of shutters) = 25, 30, 35 or 40 mm.
All dimensions in millimetres.

FIG. 5 TYPICAL CROSS SECTION OF FRAME FOR DOORS AND LARGE WINDOWS CARRYING ONE SET OF SHUTTERS

6.2 Sizes and Types

Sizes and types of the door shutters shall generally conform to the modular sizes as shown in Fig. 9. Sizes other than modular sizes, as agreed to between the manufacturer and the purchaser, may also be permitted.

NOTE – The size shown in Fig. 9 is overall height and width on the outside of frames. This size is derived after allowing a margin of 5 mm all round for fitting and fixing to fit up to modular openings based on 10 cm module. The sizes marked with asterisk in Fig. 9 will be given preference.



*R (Thickness of shutters) = 25, 30, 35 or 40 mm.
All dimensions in millimetres.

FIG. 6 TYPICAL CROSS SECTION OF FRAME FOR SMALL WINDOW AND VENTILATOR CARRYING ONE SET OF SHUTTERS

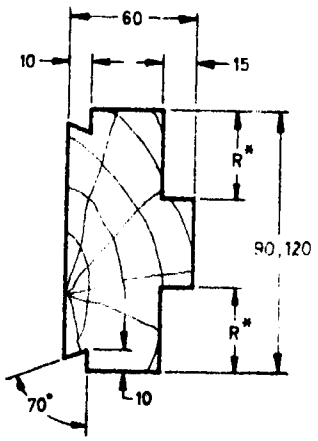
6.3 Designation

Frames of doors, windows and ventilators shall be designated by symbols denoting their width, type and

Table 2 Dimensions of Doors, Windows and Ventilators

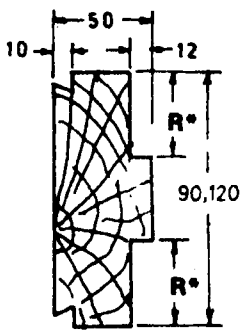
(*Clause* 6.1)

	Requirements	Dimension, mm			
		Door	Window		Ventilator
			Size > 120 cm	Size < 120 cm	
	(1)	(2)	(3)	(4)	(5)
A)	Width of frame carrying one set of shutters :				
	i) for 35, 40 mm shutter	100	100	90	90
	ii) for 25, 30 mm shutter	90	90	90	90
B)	Width of frame carrying two sets of shutters :				
	i) for 30, 35 and 40 mm shutter	120	120	120	120
	ii) for 25 mm shutter	90	90	90	90
C)	Thickness	60	60	50	50



*R (Thickness of shutters) = 25, 30, 35 or 40 mm.
All dimensions in millimetres.

FIG. 7 TYPICAL CROSS SECTION OF FRAME FOR DOOR AND LARGE WINDOWS CARRYING TWO SET OF SHUTTERS



*R (Thickness of shutters) = 25, 30, 35 or 40 mm.
All dimensions in millimetres.

FIG. 8 TYPICAL CROSS SECTION OF FRAME FOR SMALL WINDOWS AND VENTILATORS CARRYING TWO SETS OF SHUTTERS

height in succession in the following manner:

a) *Width* – It shall be indicated by the number of modules in the width of opening.

b) *Type* – It shall be indicated by the following letters of alphabet:
D for door
W for window
V for ventilator
S for single shutter
T for double shutter

NOTE – Where a frame is intended to carry two sets of shutters, the frame shall be designated as DD, WW and VV.

c) *Height* – It shall be indicated by the number of modules in height of opening.

Example:

'12 DT 20' would mean a frame of double shutter door with a width of 12 modules (119 cm) and height of 20 modules (199 cm).

6.3.1 *Combination of Frames of Doors, Windows and Ventilators*

When frames of doors and windows are combined with those of windows and ventilators, they shall be designated as illustrated below. However size of frame for such combination shall be uniform for doors, windows and vetilators, by choosing the highest recommended dimension vide **6.1**.

Example 1:

'6 WS 12/12 DT 20/6 WS 12' means 12 modules wide and 20 modules high double shutter door frame combined in its two sides with two windows, 6 modules wide and 12 modules high.

Example 2:

$\frac{6\ V\ 6}{6\ WS\ 12}\ \frac{6\ V\ 6}{6\ WS\ 12}$ means frames of two single-windows of 6 modules wide and 12 modules high combined side by side and with two ventilators at top 6 modules wide and 6 modules high.

7 LOCATION OF HOLDFASTS

A minimum of three holdfasts shall be fixed on each side of the door frame, one at the centre point and other two at 30 cm from the top and bottom of frame excepting in case of horned head when two equally spaced holdfasts shall be provided. In case of windows and ventilators one holdfast on each side centrally placed shall be fixed up to a height of 60 cm. In case of height more than 60 cm, with or without horns two holdfasts shall be suitably fixed at each side.

8 FINISH

8.1 Defective knots, when permitted on surfaces exposed to view, shall be completely bored or cut out and tightly plugged with same timber species and properly glued in. The grain of the plug shall run in the direction of the grain of the piece.

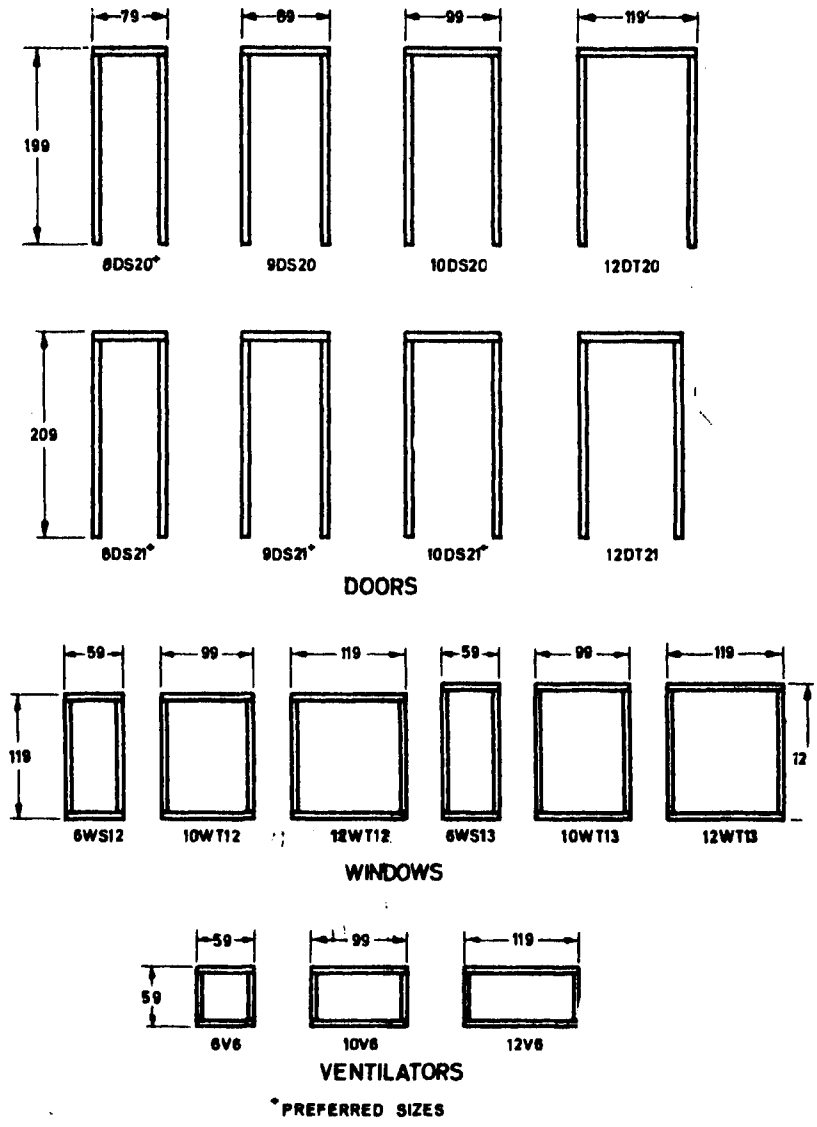
8.2 The unexposed surfaces in contact with either wall or lintel shall be properly painted with coal tar pitch (conforming to IS 216 : 1961) before delivery.

8.3 All surfaces of door, window and ventilator frames which are required to be painted ultimately shall be covered evenly by brush painting with a priming coat of a wood primer as specified in IS 3536 : 1966.

8.3.1 In the case of frames to be polished or varnished, a priming coat of suitable polish or varnish shall be given before delivery.

NOTES

1 Priming alone does not provide full protection against weather and, therefore, all work should receive coats of



All dimensions in centimetres.

FIG. 9 TYPE AND SIZE OF FRAME OF TIMBER DOORS, WINDOWS AND VENTILATORS

paint, polish or varnish, as the case may be, within a reasonable period. Any cut surface, particularly that exposing end grain should be primed before the joinery is set in position.

2 When aluminium primer is used, the user should assure himself that it is of a type especially prepared for this purpose. Unless suitable aluminium primers are used, it is not possible to obtain satisfactory finish.

9 SAMPLING

The method of drawing representative samples of timber door, window and ventilator frames and the criteria for conformity shall be as given in Annex C.

10 MARKING

10.1 All door, window and ventilator frames shall be hammer-marked on the exposed surface with the following information:

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

b) Whether the size of the frame is 'Modular' or 'Non-modular'; and

c) Designation (showing width and height in modules) with Type as specified in Fig. 9; or the actual size (width and height in case of non-modular sizes) along with appropriate symbols for type of frame as given in **6.3** (b) and Fig. 9.

10.2 BIS Certification Marking

The frames may also be marked with Standard Mark.

10.2.1 The use of the Standard Mark is governed by the provisions of 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.

11 INFORMATION TO BE SUPPLIED BY THE PURCHASER

The purchaser shall supply the following information at the time of placing the order:

a) The size and the type of frames with particulars regarding the way the door-shutter is required to open (inward or outward). The thickness of the shutter and whether to be used on exterior or interior door shall also be indicated.

b) In frames without sills, whether pins are required to be provided.

c) The group and grade of timber to be used.

d) Whether the door is to be polished or painted.

e) If there is a ventilator on the top it may be stated whether it is top hung, bottom hung or centre hung so that the rebate in the frame is cut accordingly.

ANNEX A

(*Clause* 2)

LIST OF INDIAN STANDARDS

IS No.	*Title*	*IS No.*	*Title*
216 : 1961	Specification for coal tar pitch (*first revision*) (Reaffirmed 1991)	852 : 1994	Specification for animal glue for general wood working purposes (*second revision*)
287 : 1993	Recommendations for maximum permissible moisture content of timber used for different purposes (*third revision*)	1141 : 1993	Code of practice for seasoning of timber (*second revision*)
401 : 1982	Code of practice for preservation of timber (*third revision*) (Amendments 2) (Reaffirmed 1990)	1331 : 1971	Specification for cut sizes of timber (*second revision*) (Reaffirmed 1992)
707 : 1976	Glossary of terms applicable to timber technology and utilization (*second revision*) (Amendment 1) (Reaffirmed 1990)	3536 : 1966	Ready mixed paint, brushing, wood primer, pink (Amendments 4) (Reaffirmed 1988)
848 : 1974	Specification for synthetic resin adhesives for plywood (phenolic and aminoplastic) (*first revision*)	4835 : 1979	Polyvinyl acetate dispersion based adhesives for wood (*first revision*) (Amendments 2) (Reaffirmed 1990)
851 : 1978	Specification for synthetic resin adhesives for construction work (non-structural) in wood (*first revision*) (Amendment 1) (Reaffirmed 1990)	10428 : 1983	Glossary of terms relating to doors (Reaffirmed 1991)
		12896 : 1990	Classification of Indian timbers for door and window shutters and frames

ANNEX B

(*Clause* 4.1.1)

LIST OF SPECIES OF TIMBER BEING IMPORTED FOR FRAMES OF DOORS AND WINDOWS CONSIDERED SUITABLE FROM THE FOREIGN LITERATURE AVAILABLE

Sl No.	Trade Name	Botanical Name	Country from Where Imported
(1)	(2)	(3)	(4)
i)	Abura	*Mitragyna Stipulosa*	Africa (A)
ii)	Afrormosia†	*Afrormosia ungolensis*	A
iii)	Alan Batu*	*Shorea albida*	Malaysia (M)
iv)	Dark Red Meranti	*Shorea* spp.	M
v)	Iroko †	*Chlorophora excelsa*	A
vi)	Keruing	*Diapterocarpus* spp.	M
vii)	Kwila*	*Instia bijuga*	PNG
viii)	Merawan*	*Hopea* spp.	M
ix)	Merbau*	*Intsia palembanica*	M
x)	Nyatoh*	*Ganua* spp. *Palaquium* spp. and *Payuena* spp.	M
xi)	Terminalia red brown group*	*Terminalia* spp.	PNG
xii)	Utile*	*Entandophragma utile*	A
xiii)	Vitex*	*Vitex cofassus*	PNG

NOTE – Above imported species shall be used for frames only after proper treatment as prescribed in IS 401 : 1982 and concerned clauses of this standard, as suitable and sufficient information regarding their durability is not available and whatever is available may not fully hold good in Indian conditions. However, heartwood of species marked '†' does not require treatment as the same is reported to be very durable. Further, where sufficient retention/absorption/penetration of preservative is not obtained as per IS 401 : 1982 due to poor treatability character of the species, the frame shall be treated with PCP solvent system after construction to ensure minimum penetration of preservative to the depth of 2 mm in the finished product by soaking in 5% PCP solution for 24 h or pressure treatment. Such species which are refractory to treatment are marked '*'.

ANNEX C

(*Clause* 9)

SAMPLING OF TIMBER DOOR, WINDOW AND VENTILATOR FRAMES

C-1 LOT

C-1.1 In any consignment all the frames of the same type, size and manufactured from the same species of wood under similar conditions of production shall be grouped together to constitute a lot.

C-1.1.1 Samples shall be selected and tested from each lot separately to determine its conformity or otherwise to the requirements of this standard.

C-2 SAMPLING

C-2.1 The number of frames to be selected at random from a lot for inspection shall depend upon the size of the lot (the number of frames in the lot) and shall be in accordance with col 1 and 2 of Table 3.

C-2.2 The samples from the lot shall be selected at random and to ensure the randomness of selection, procedures given in IS 4905 : 1968 may be followed.

C-2.3 All the frames selected in the sample shall be inspected for material (*see* 4), dimensions and tolerances (*see* 6) and workmanship and finish (*see* 5 and 8).

Table 3 Sample Size and Permissible Number of Defectives

(*Clause* C-2.1)

Lot Size	Sample Size	Permissible Number of Defectives
(1)	(2)	(3)
Up to 50	8	0
51 to 100	13	1
101 to 150	20	2
151 to 300	32	3
301 to 500	50	5
501 and above	80	7

C-3 CRITERIA FOR CONFORMITY

C-3.1 A frame which is found not meeting any one or more of the requirements inspected as in C-2.3 shall be considered as defective.

C-3.2 A lot shall be considered as conforming to the requirements of this standard in case the number of defective frames found in the sample does not exceed the permissible number of defectives given in col 3 of Table 3.

ANNEX D
(Foreword)

COMMITTEE COMPOSITION

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(*Continued on page* 14)

(*Continued from page* 13)

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