

(DZONGKHA TITLE)

**BHUTAN STANDARD**

**Timber Panelled and Glazed Window Shutters- Specification**



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## **FOREWORD**

This Bhutan Standard for Timber Panelled and Glazed Window Shutters - Specification was adopted by Bhutan Standards Bureau after the draft finalized by the Wood and Timber Product Standards Technical Committee TC 07 and approved by the Bhutan Standards Bureau Board (BSB Board) on xxxx 2021

This standard is subject to systematic review after five years to keep pace with the market trends, industrial and technological developments. Any suggestions and further information may be directed to the concerned Technical Committee.

# **(DZONGKHA)**

## **BHUTAN STANDARD Timber Panelled and Glazed Window Shutters- Specification**

### **1 Scope**

1.1 This standard lays down the requirements regarding material, sizes, construction, workmanship, finish, inspection and testing of timber window shutters generally used in residential and institutional buildings.

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

1.3 Panel inserts used with timber shutter frames shall be timber, plywood, block board, wire gauze and glass panels.

### **2 Normative References**

The following documents are indispensable for application of this document. For dated references, only the edition cited applies, for undated references, the latest edition of the latest document (including any amendments) applies.

BTS 119: 2018 IS 303: 1989 Plywood for General Purposes – Specification

FDBTS 346: 2021 D4442-20 Standard Test Methods for Direct Moisture Content Measurement of Wood and WoodBased Materials

FDBTS 347: 2021 IS 401: 2001 (reaffirmed 2002) Preservation of Timber – Code of Practice

FDBTS 348: 2021 IS 851: 1987 Specification for Synthetic Resin Adhesives for Construction Work (Non-Structural) in Wood Practice

FDBTS 349: 2021 IS 1659: 2004 Block Boards - Specification

FDBTS 351: 2021 IS 2835: 1987 Specification for Flat Transparent Sheet Glass

FDBTS 352: 2021 IS 2553 (Part I): 2018 Safety Glass – Specification Part 1: Architectural, Building and General Uses (Fourth Revision)

FDBTS 154:2021 IS1568: 1970 Specification for Wire Cloth for General Purposes (First Revision)

### **3 Terms and Definition**

3.1 Beading – strip of wood used to hold door panels with shutter frames

3.2 Block boards – a pre-engineered wood product manufactured from wooden strips or blocks placed edge to edge between two layers of plywood which are then glued together under required pressure

3.3 Dead knots - a knot in which the layers of annual growth are not completely intergrown with those of the adjacent wood. It is surrounded by pith or bark. The encasement may be partial or complete



- 3.4 Double leafed shutter – window frame carrying one shutter each
- 3.5 Holdfasts – are fasteners used to firmly hold the door frames on the jamb
- 3.6 Live knots - a knot free from decay and other defects, in which the fibres are firmly intergrown with those of the surrounding wood
- 3.7 Modular Width – the width provided in this standard for calculating dimensions and sizes
- 3.8 Muntin/Glazing bars - a strip of wood or metal separating and holding panes of glass in a window
- 3.9 Panel – components of window shutter constructed in the framework of rails and stiles
- 3.10 Panel Inserts – types of panel inserted based on the materials
- 3.11 Pin hole - hole not over 2 mm in diameter, usually darkly stained and not containing bore dust or frass
- 3.12 Pitch pockets - accumulation of resin between growth rings of coniferous wood as seen on the cross-section
- 3.13 Plywood - a pre-engineered wood product manufactured from thin layers of wood also called as wood veneer that are glued together with adhesive
- 3.14 Preservatives - a substance or a chemical that is added to wood to prevent decomposition by microbial growth or by undesirable chemical changes
- 3.15 Profile – the ornamentation provided at the shutter frame and the beading
- 3.16 Rail - the horizontal shutter frame of the window.
- 3.17 Rebate - a recess along the edge of a piece of timber to receive another piece or a door, sash or frame
- 3.18 Sapwood - the outer layers of the log, which in the growing tree contain living cells and food material. The sapwood is usually lighter in colour and is readily attacked by insects and fungi
- 3.19 Stiles – the vertical shutter frame of the window.
- 3.20 Window Shutter - are movable barrier consisting of a panelled assembly or otherwise which fits into the frame
- 3.21 Worm hole – hole made by a burrowing worm

## **4 Materials**

### **4.1 Timber**

Timbers suitable for the manufacture of door shall be in accordance with timber classification as specified in **ANNEX-A** of this standard. Timber used for rails and stiles shall be of the same species. All the panels where they are of solid wood shall be of one species which may or may not be the same species as that of rails and stiles.

#### **4.1.1 Defects**

Defects like decay, fungal growth, boxed heart, splits, pitch pocket or streaks on the exposed faces shall be prohibited. However, 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**.

**Table 1: Permissible Defects in Various Grades of Timber**

SL.No	Defects	First Grade	Second Grade
1	Cross Grain	Not steeper than 1 in 15	Not steeper than 1 in 10
2	Sound Knots and live knots a) Size, Max b) Number per metre	1) Stiles and rails  Not more than 15 mm size and not more than 1 knot/m <sup>2</sup> No knot shall occur within 20 mm of the edges  2) Panels - Not more than 20 mm Size and not more than 2 knots/m <sup>2</sup> No knot shall occur on edge of any component of a panel	1) Stiles and Rails  Not more than 15 mm Size and not more than 3 knots per stile and 1 knot per rail  2) Panels - Not more than 20 mm Size and not more than 4 knots/m <sup>2</sup> No knot shall occur on edge of any component of a panel
3	Dead and loose knots (Plugged)	1) Stiles and Rails - Not more than 10 mm size centrally located and not more than 1 knot/m <sup>2</sup>  2) Panels - Not more than 15 mm size and not more than 2 knots/m <sup>2</sup> No knot shall occur on edge of any component of a panel	1) Stiles and Rails - Not more than 10 mm Size, centrally located and not more than 3 knots per stile and 1 knot per rail  2) Panels - Not more than 15 mm size and not more than 4 knots/m <sup>2</sup> No knot shall occur on edge of any component of a panel
4	Pitch pockets or streaks	None	Permissible except on exposed edges, provided that they are clean and filled up with suitable putty or with filler. When pitch pockets or streaks are located on the exposed edges of the core, they shall be cut out and filled with piece of wood of similar species with grain running in the same direction. The piece shall be well glued
5	Sapwood	Total not exceeding 5mm wide and 150mm long per metre	Total not exceeding 10mm wide and 300mm long per metre
6	Pin Holes	Permitted provided they are not in clusters	Permitted
7	Worm holes	None	Permitted provided they are not more than 10mm in diameter and not more than one per meter 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

#### **4.1.2 Seasoning and Treatment**

Any piece of wood will give off or take in moisture from the surrounding atmosphere until the moisture in wood has come to a balance with the existing atmospheric conditions. The moisture content at which timber neither gains nor loses moisture when subject to a given constant condition of temperature and humidity is known as equilibrium moisture content corresponding to that condition.

Seasoned timber (whether air or kiln dried) shall conform to the moisture content requirements as specified in **Table 2** if the averaged moisture content of all the samples from a given lot is within the permissible limit. Sapwood of durable species in hardwood and sapwood of non-durable species shall be treated with suitable preservatives (except the water soluble leachable type) as specified in **FDBTS 347: 2021 2021/IS 401: 2001 (reaffirmed 2002)**.

**Table 2 - Permissible Moisture Content of Timber Window Shutters**

Door components	Moisture Content, Percent, Max	Average Moisture Content of all samples from a lot shall be	Moisture Content of individual samples shall be	Test Method
Thinner than 50 mm	14%	+2%	Within +3%	

## **4.2 Plywood**

Plywood used for panelling of door shutters shall conform to BTS 119: 2018 IS 303: 1989.

## **4.3 Block boards**

Block boards used for door shutters shall confirm to Grade 1 (exterior grade) of FDBTS 349: 2021 IS 1659: 2004.

## **4.4 Wire Gauze**

Wire gauze used for panels shall conform to IS FDBTS 154:2021 IS1568: 1970.

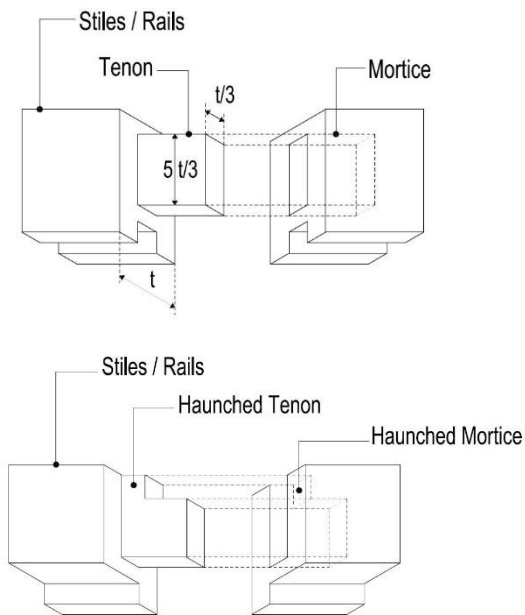
## **4.5 Glass**

Glass for glazing shall conform to FDBTS 351: 2021 IS 2835:1987 or FDBTS 352: 2021 IS 2553 (Part I): 2018. The users may also specify the type of glass to be used, such as frosted glass, wire glass and coloured glass and the requirements for them.

# **5 Constructions and Workmanship**

## **5.1 General**

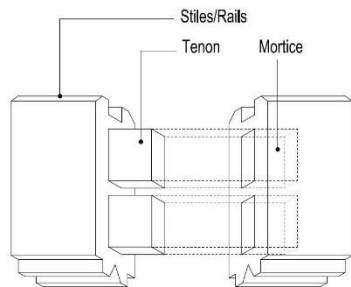
**5.1.1** Panelled and glazed shutters shall be constructed in the form of timber framework of stiles and rails with panel inserts of timber, plywood, block board, wire gauze and glass. The panels shall be fixed by either providing grooves in the stiles and rails or beading or both (see **5.2**). The stiles and rails shall be joined to each other by mortice and tenon joints (see **Fig.1**) and the profile of stiles and rails shall be as agreed between the supplier and purchaser.



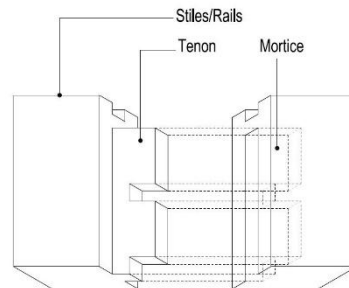
a) Single Mortice and Tenon Joint in Top Rail  
Tenon Joint

b) in Top Rail

b) Haunched single Mortice and



c) Double Mortice and Tenon Joint in Lock Rail



d) Haunched double Mortice and Tenon Joint in  
Bottom Rail

Fig.1 Typical illustration of tenon and haunched tenon in joinery

**5.1.2** All members of the window shutters shall be straight, smooth and well planed faces at right angles to each other. Any warp or bow shall not exceed 1.0 mm. The right angle for the shutters shall be checked by measuring the two diagonals from one extreme corner to the opposite one and the difference between the two diagonals shall be not more than 3 mm.

**5.1.3** For fitting of shutter between rebates of the frame, a clearance of 1.5 mm shall be retained for the thickness of paint which is applied subsequently and also to meet the exigencies due to any swelling, etc.

**5.1.4** Stiles and rails of shutters shall be made out of one piece of timber only.

**5.1.5** Muntin and glazing bars shall be stub tenoned to the maximum depth which the size of the member would permit or to a depth of 25 mm, whichever is less.

**5.1.6** Some of the common methods for jointing of panels with stiles/rails are shown in Fig. 2. The minimum depth of grooves of stiles and rails shall be 12 mm for all types of panelling. The panels shall be framed into grooves to the full depth of groove leaving an air space of 1.5 mm and the faces shall be closely fitted to the sides of the groove. The rest of the details shall be as given in 5.6 to 6.10 for respective panel materials.

## 5.2 Beading

Timber panels shall be fixed only with grooves but additional beading may be provided either on one side or on both sides, if so desired. Plywood and blockboard shall have either grooves or beading or both. In so far as glass and wire gauge are concerned, beading shall always be provided without grooves. In such cases, that is where beading is provided without the grooves, the beading shall be only on one side, the other side being supported by rebate from stiles see (**Fig.2**). The beading shall have a size not less than 15 mm x 10 mm and its profile shall be as agreed between the supplier and the purchaser. It can be fixed by suitably nailing or screwing.

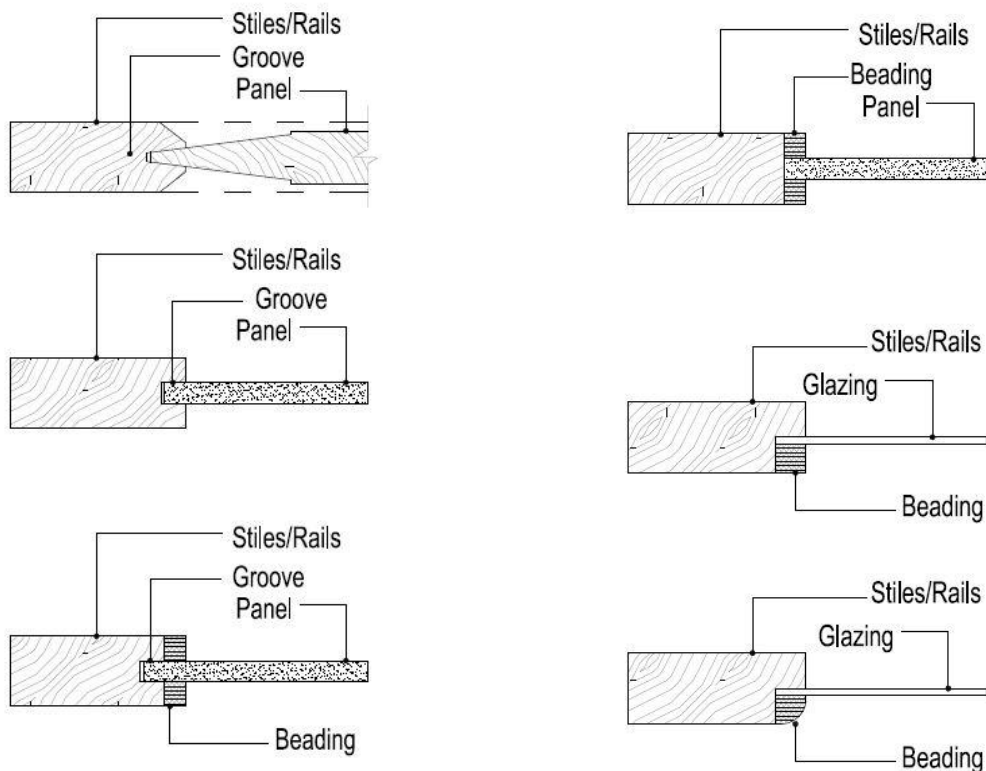


Fig. 2 Common method of jointing panels with stiles and rails

### **5.3 Timber Panelling**

Timber panels shall be preferably made of timber of larger width; the minimum width and thickness of a panel shall be 100 mm and 15 mm respectively. When made from more than one piece, the pieces shall be jointed with a tongued and grooved joint, depth of joint extending to one-third of thickness of panel and the thickness of joint also as one-third of panel. The grains of timber panels shall run along the longer dimensions of the panels. The panels shall be designed such that no single panel exceeds  $0.5 \text{ m}^2$  in area. Beading may be done as **clause 5.2**.

### **5.4 Plywood Panelling**

Each plywood panels shall be of one piece of not less than 9 mm thickness for 2 or more panel construction and 12 mm thickness for single panel construction. There shall be no restriction on the size of the panel.

### **5.5 Blockboard Panelling**

5.10.1 Each block board panel shall be of one piece of thickness 12 mm or more and there shall be no restriction on the size of the panel.

### **5.6 Wire Gauze Panelling**

Wire gauze panel shall be so designated that no single panel exceeds  $0.5 \text{ m}^2$  in area.

### **5.7 Glazing**

**5.7.1** The glass used for panels shall be of good and durable quality, weighing not less than  $10 \text{ kg/m}^2$  and the thickness shall not be less than 4 mm. The particular type, quality and shade shall be as agreed to between the purchaser and the supplier.

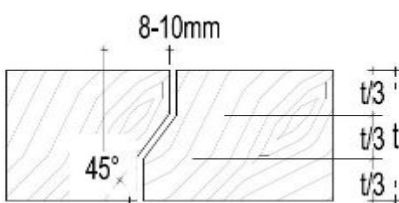
**5.7.2** In specifying sizes of openings or panels of glass, the first dimension shall be the width.

**5.7.3** The glass shall be embedded in putty and secured to the rebate by wooden beads of suitable size and shape.

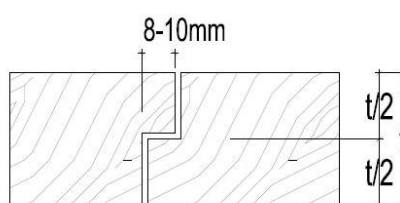
**5.7.4** Wash leather, ribbon velvet, rubber flannel or other similar material may be used in place of putty for internal glazing. The material shall be fitted either as a beading on one side or in such a manner that it covers all parts of the glass which will be covered by the beading.

### **5.8 Rebating**

In case of double-leaved shutters the meeting of the stiles shall be rebated either splayed or square type as shown in **Fig.3**.



**c) Splayed Type**



**b) Square type**

Fig.3 Meeting of stiles for double leafed shutter

## 5.9 Gluing of Joints

The contact faces of tenon and mortise shall be cleaned and treated with bulk type synthetic adhesives conforming to **FDBTS 348: 2021/IS 851: 1978** before putting together. The members shall be placed in proper position and further secured with suitable nails and screws. However, gluing of joints is optional and may be done with the agreement between the purchaser and the supplier.

## 6 Dimensions, Sizes and Tolerances

### 6.1 Dimensions of Components and Tolerances

The finished dimensions and tolerances of the different components of window shutters shall be as given in **Table 3**.

**Table 3: Sizes and Tolerances of Components of Door Shutters**

Sl.No	Descriptions	Width (mm)	Thickness (mm)
1	Stile and Rail	90 $\pm$ 3	35 $\pm$ 1 or 40 $\pm$ 1
2	Muntin	65 $\pm$ 3	35 $\pm$ 1 or 40 $\pm$ 1
3	Glazing bar	40 $\pm$ 1	35 $\pm$ 1 or 40 $\pm$ 1

### 6.2 Sizes and Types

Sizes and types of the panelled and glazed shutters shall generally conform to the modular sizes specified in **Table 4** (see also **Fig.4**). Sizes other than modular sizes as agreed to between the manufacturer and the purchaser may also be permitted.

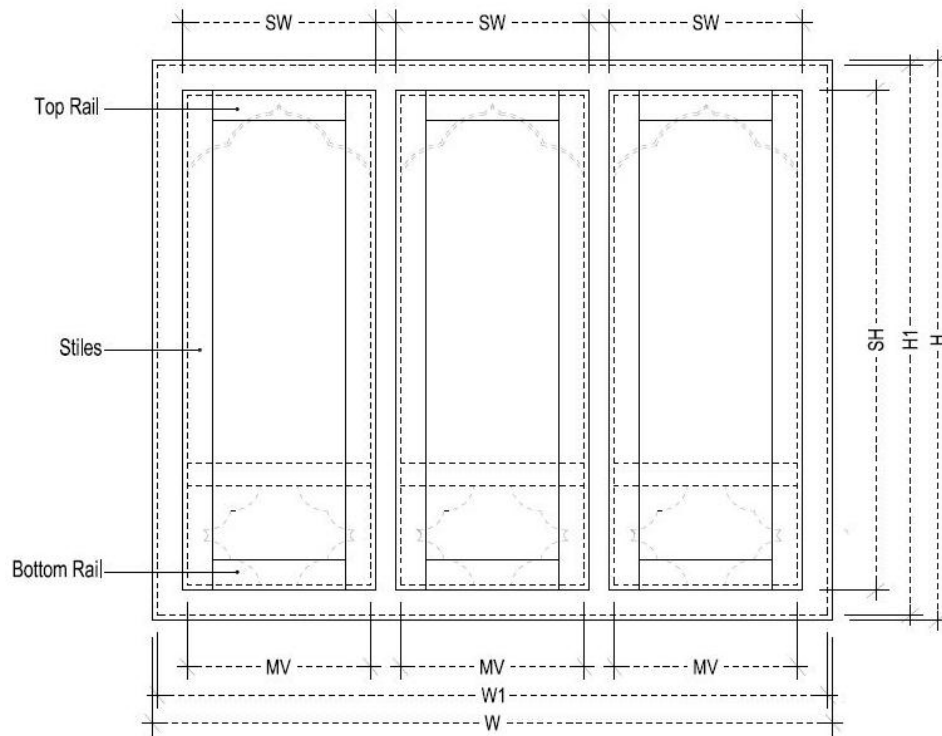


Fig.4 Sketch illustrating Type I Window Shutter

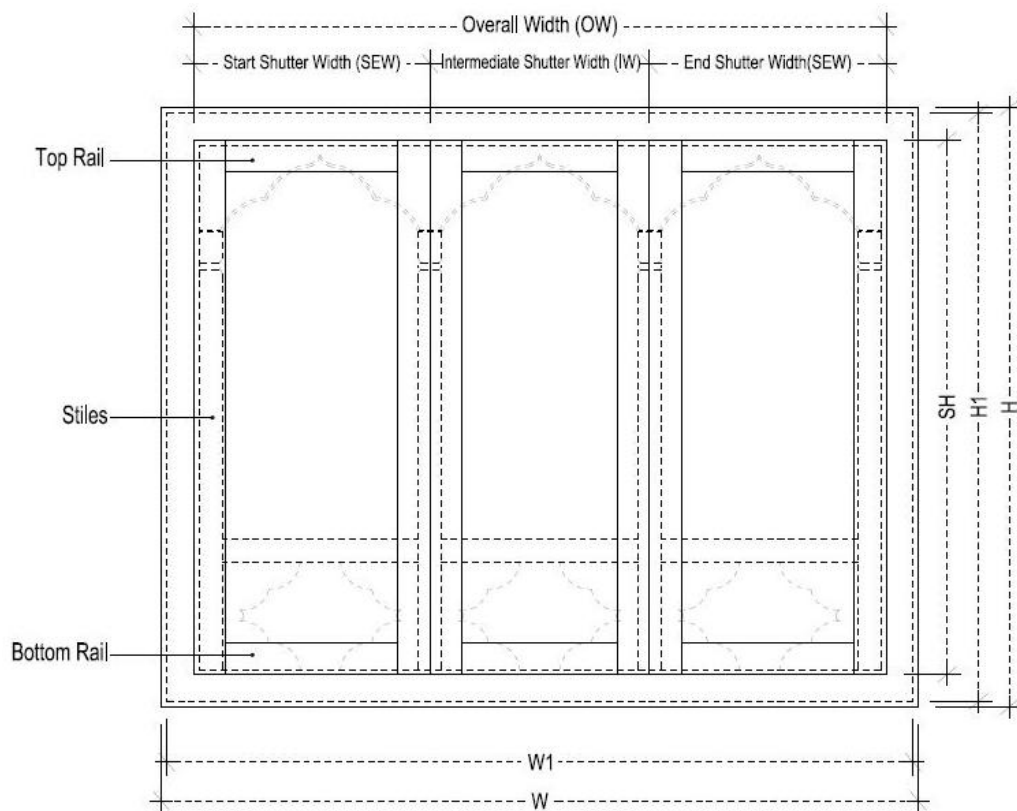


Fig.5 Sketch illustrating Type II Window Shutter



**Table 4: Height of Window Shutters for both Window Types (Type I and Type II) with respect to Frame Dimensions of BTS 343: 2021**

Window Type	Sub-Category	Opening Dimensions of Windows (W mm x H mm)	Actual Window Dimensions (W <sub>1</sub> mm x H <sub>1</sub> mm)	Shutter Height SH = [H <sub>1</sub> – 2 (A-15)] mm
Type I	Type I-A	(W+10) x 1650	(W) x 1640	1490
	Type I-B	(W+10) x 1350	(W) x 1340	1190
	Type I-C	(W+10) x 1000	(W) x 990	840
Type II	Type II-A	(W+10) x 1650	(W) x 1640	1490
	Type II-B	(W+10) x 1650	(W) x 1640	2 Numbers of 715 mm shutters
	Type II-C	(W+10) x 1350	(W) x 1340	840

Note:

1. Except for Type II-B; SH = [(H<sub>1</sub>-2\*90+2\*15)/2]

Where;

H<sub>1</sub>= Actual height of Window

90 is the constant width of the Shutter Frame

15 is the constant depth of rebate

2 = Number of similar shutters

**Table 5: Width of Window Shutters for Window Type I with respect to Modular Width of BTS 343: 2021**

Sl.No	Modular Width MV (mm)	Shutter Width SW (mm) = MV + 30
1	450	480
2	550	580
3	650	680
4	750	780

**Table 6: Width of Window Shutters for Window Type II with respect to Modular Width of BTS 343: 2021**

Modular Width (mm)	Width of the Window Shutters in mm														
	1 Eye			2 Eyes			3 Eyes			4 Eyes			5 Eyes		
	OW	SEW	IW	OW	SEW	IW	OW	SEW	IW	OW	SEW	IW	OW	SEW	IW
<b>450</b>	610	NA	NA	1125	562.5	NA	1640	562.5	515	2155	562.5	515	2670	562.5	515
<b>550</b>	710	NA	NA	1325	662.5	NA	1940	662.5	615	2555	662.5	615	3170	662.5	615
<b>650</b>	810	NA	NA	1525	762.5	NA	2240	762.5	715	2955	762.5	715	3670	762.5	715
<b>750</b>	910	NA	NA	1725	862.5	NA	2540	862.5	815	3355	862.5	815	4170	862.5	815

Where;

d) For Windows with 1 Eye;  $OW = MV + 2 \times 65 + 2 \times 15 = MV + 160$

e)

f) For Windows with 2 Eyes;  $OW = 2SEW$

g)  $SEW = MV + (65/2) + 65 + 15 = MV + 112.5$

h)  $IW = \text{Not applicable (NA)}$

i)

j) For Windows with 3 Eyes;  $OW = 2SEW + IW$

k)  $SEW = MV + 112.5$

l)  $IW = MV + 65$

m)

n)

o) For Windows with 4 Eyes;  $OW = 2SEW + 2IW$

p)  $SEW = MV + 112.5$

q)  $IW = MV + 65$

r)

s)

t) For Windows with 5 Eyes;  $OW = 2SEW + 3IW$

u)  $SEW = MV + 112.5$

v)  $IW = MV + 65$

Where;

OW is the Actual Overall Width of the Window Shutter see **Fig.6**

For MV refer **Table 5** and **Table 6**, and **Fig.1** to **Fig.6** of BTS 343: 2021

SEW is the Actual Width of the Start and End Shutters see **Fig.6**

IW is the Actual Width of the Intermediate Shutters see **Fig.6**

65 is the constant width of the Kachung

15 is the depth of rebate

### 6.3 Tolerances

Tolerances on the sizes of window shutters shall be  $\pm 3$  mm

## 7 Location of Fittings and Accessories

**7.1** Each window shutter shall be fixed to the frame with two hinges of the suitable type generally at quarter points. Prefer locating hinges so that the bottom hinge is at a larger distance (say 15 cm) from the lower end of shutter than the distance for the upper hinge (say 10 cm) from the upper end of shutter.

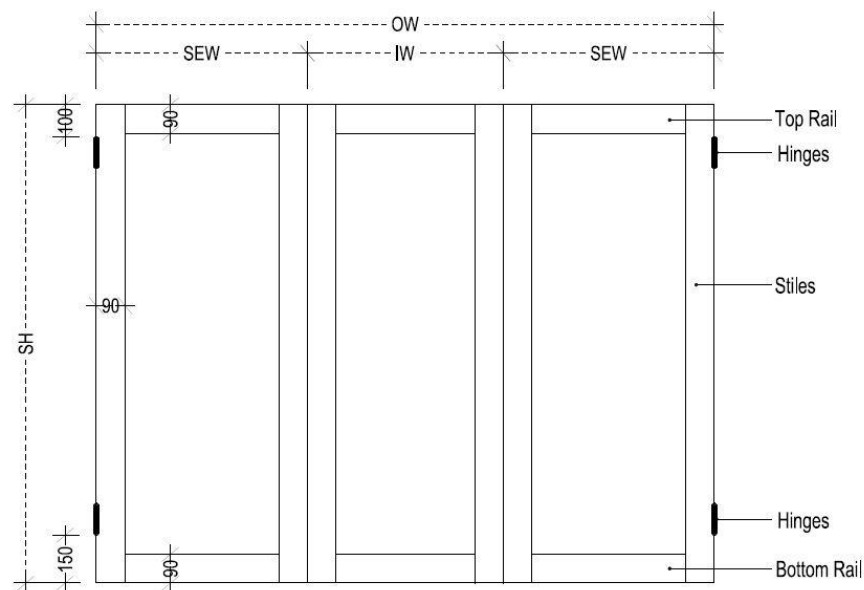


Fig.6 Location of fittings and accessories

## 8 Finishing

8.1 All shutter components exposed to view shall be sanded and finished smooth with minimum 200 grit abrasive.

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

8.3 In the case of timber shutter frames or timber panel inserts to be polished or varnished, a suitable wood primer shall be applied before delivery.

## 9 Tests

Door shutters shall be subjected to the following tests.

## 9.1 Dimensions and Squareness Test

Window shutters, when tested in accordance with FDBTS 153: 2021 IS 4020 (Part 2): 1998, the dimensions of nominal width and height shall be within a limit of  $\pm 5$  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 two points. The nominal thickness of the shutter shall be within a limit of  $\pm 1$  mm.

## 9.2 General Flatness Test

Window shutters, when tested in accordance with FDBTS 153: 2021 IS 4020 (Part 3): 1998, the twist, cupping and warping shall not exceed 6mm.

## 9.3 Slamming Test

Shutters shall be tested for resistance to slamming as per the procedure given in Annex C. There shall be no visible damage caused in any part of the shutter after 50 drops. This test is not applicable to glazed and wire gauzed panelled shutters. This test shall be conducted on production of every 1 000 shutters or with every change of design.

## 10 Marking

All shutters shall be provided with the following information:

- a) Name of Manufacturer trade-mark
- b) Timber Species
- c) Designation
- d) Batch number; and
- e) Month and year of manufacture.

## 11 Sampling

In any consignment all the shutters 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. Samples shall be selected and tested from each lot separately to determine its conformity or otherwise to the requirements of this standard.

The number of samples to be selected at random from a lot for inspection shall depend upon the size of the lot (the number of Shutters in the lot) and shall be in accordance to the information given in the **Table 5**. All the shutters selected in the sample shall be inspected for material, dimensions, tolerances, workmanship, joinery and finish.

A shutter, which is not meeting any one of the requirement, shall be considered as defective. A lot shall be considered as conforming to the requirements of this standard in case the number of defective shutter found in the sample does not exceed the permissible number of defectives. However, the defective ones shall not be counted for supply.

**Table 5- Sample size and permissible number of defectives**

<b>Lot Size</b>	<b>Sample Size</b>	<b>Permissible number of Defectives</b>
26 to 50	5	0
51 to 100	8	0
101 to 150	13	1
151 to 300	20	2
301 to 500	32	3
501 and 1000	50	5

## **12 Information to be supplied by the Purchaser**

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

- a) The purchaser shall provide drawings and details of requirements,
- b) Whether any other provisions has to be made;
- c) Whether the shutter are to be polished or painted.

# FDBTS 345: 2021

## ANNEX A

List of Commonly available/used timber species

**Note:** the timber classification is based on the Royalty Schedule approved by the Ministry of Agriculture and Forest. However the list is subjected to change as per the government directives

### a) Special Class

Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
1	Acacia catechu	Broadleaved	Toeja	Toeja	Khair	Cutch tree	yes	yes	yes	yes
2	Aquilaria agalocha	Broadleaved	Agoor	Agoor	Aghoree	Agarwood	no	no	no	no
3	Cupressus	Conifer	Tshendey	Tshenden-shing	Dhupi	Cypress	yes	yes	yes	Yes
4	Dalbergia sissoo	Broadleaved	Jaseng	-	Sissoo	North Indian Rosewood	Yes	Yes	Yes	Yes
5	Juglans regia	Broadleaved	Ta-shing	Kheshing	Okhar	Walnut	Yes	Yes	Yes	Yes
6	Junipers spp.	Conifer	Shoop	Shookpu-shing	Dhupi	Juniper	yes	yes	yes	Yes
7	Morus laevigata	Broadleaved	Tshende	Phroom-tekpa shing	Kimbu	Himalayan Mulberry	Yes	Yes	Yes	Yes
8	Shorea robusta	Broadleaved	-	-	Sal	Sal tree	Yes	Yes	Yes	Yes
9	Taxus baccata	Conifer	Ha-shing	Keerang-shing	Dhengre salla	Yew	yes	yes	yes	yes
10	Tectona grandis	Broadleaved	-	-	Sagoon	Teak	Yes	Yes	Yes	Yes

## b) A Class

Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
1	Acer spp.	Broadleaved	Chalam	Sermaling-shing	Kapasey	Maple	yes	yes	yes	yes
2	Albizia lebbeck	Broadleaved	Khrithang-shing	-	Kalo siris	Lebbek tree	yes	yes	yes	yes
3	Betula alnoides	Broadleaved	Taap	Char-shing	Saur	Birch	yes	yes	yes	yes
4	Betula bhutanica	Broadleaved	Taap	Chaar-shing	Bhoj Patra	Birch	yes	yes	yes	yes
5	Dipterocarpus macrocarpus	Broadleaved	-	Hollong	-	-	yes	yes	yes	yes
6	Duabanga grandiflora	Broadleaved	Patang shing	Bikaling shing	Lampatey	-	yes	yes	yes	yes
7	Gmelina arborea	Broadleaved	Gamar shing	Kholom shing	Gamari/Kha mari	Beechwood	yes	yes	yes	yes
8	Michelia champaca	Broadleaved	Kha-shing	Kar-shing	Champ	Champak tree	yes	yes	yes	yes
9	Phoebe goalparensis	Broadleaved	-	Sechanglu-shing	Bonsum	Assam Teak	yes	yes	yes	yes
10	Michelia excelsa	Broadleaved	-	Champay-shing	Rani champ	The Temple Magnolia Doltsopa	Yes	Yes	Yes	Yes

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Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
11	Pinus Bhutanica	Conifer	Tongphu	Chang-shing	Salla	Bhutan pine	Yes	Yes	Yes	Yes
12	Pinus wallichiana	Conifer	Tongphu	Chang-shing	Salla	Bluepine	Yes	Yes	Yes	Yes
13	Terminalia myricarpa	Broadleaved	-	-	Hollok/Panisaj	East Indian almond	Yes	Yes	Yes	Yes
14	Terminalia tomentosa	Broadleaved	-	-	Pakhasaj	Indian Laurel	Yes	Yes	Yes	Yes



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### c) B Class

Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
1	<i>Abies densa</i>	<i>Conifer</i>	Dung-shing	Waangshing	Gobresalla	Silver fir	Yes	Yes	Yes	Yes
2	<i>Acrocarpus framinifolious</i>	<i>Broadleaved</i>	-	-	Mandaney	Indian Ash	Yes	Yes	Yes	Yes
3	<i>Adina cordifolia</i>	<i>Broadleaved</i>	-	-	Haldu	Kadam	yes	yes	yes	yes
4	<i>Ailanthus grandis</i>	<i>Broadleaved</i>	-	-	Gokul	Tree of Heaven	No	No	No	No
5	<i>Alangium excelsa</i>	<i>Broadleaved</i>	-	-	Jhikri	Alangium	No	No	No	No
6	<i>Ammora willichii</i>	<i>Broadleaved</i>	-	-	Lali	Amoora wallichii King	Yes	Yes	Yes	Yes
7	<i>Artocarpus chaplasi</i>	<i>Broadleaved</i>	-	-	Latar	Jack tree	no	no	no	no
8	<i>Bohemeria regulosa</i>	<i>Broadleaved</i>	-	Dongtsong-Shing	Dhar	False nettles	No	No	No	No
9	<i>Bucklandia populea</i>	<i>Broadleaved</i>	-	-	Pipla	Pipli tree	Yes	Yes	Yes	Yes
10	<i>Bombax ceiba</i>	<i>Broadleaved</i>	Pema geyser	Pema geyser	Semal	Cotton tree	No	No	No	No

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Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
11	Cassia fistula	Broadleaved	-	Dhongkala say Shing	Sonalu	Indian laburnum	No	No	No	No
12	Cedrela toona	Broadleaved	Chhuen-shing	Rawa shing	Tooni	Chinese Mahagony	Yes	Yes	Yes	Yes
13	Chukrasia tabularis	Broadleaved	-	-	Chekrasi	White Cedar	Yes	Yes	Yes	Yes
14	Elaeocarpus spp.	Broadleaved	-	Gasha-thung shing	Bhadrasi	Wooden begar (Olive fruited)	Yes	Yes	Yes	Yes
15	Larix griffithii	Conifer	Zaashi	-	Bhangre salla	Larch	Yes	Yes	Yes	Yes
16	Phoebe bainesiana	Broadleaved	-	-	Aangare	Bonsum	Yes	Yes	Yes	Yes
17	Picea spinulosa	Conifer	Bashi	-	-	Spruce	Yes	Yes	Yes	Yes
18	Pinus roxburghii	Conifer	Theytong	Roinangshing	-	Chirpine	Yes	Yes	Yes	Yes
19	Schima wallichii	Broadleaved	Puyam	Zalashing	Chiluane	Chinese Guggar tree	Yes	Yes	Yes	Yes
20	Tsuga dumosa	Conifer	Sah shing	-	Dengre salla	Hemlock	Yes	Yes	Yes	Yes
21	Alnus spp.	Broadleaved	Gama shing	Gamo shing	Utis	Nepal Black Sedar	No	No	No	No

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Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
22	Anthocephalus kadamba	Broadleaved	-	-	Kadam	burflower-tree	Yes	Yes	Yes	Yes
23	Artocarpus hirsuta	Broadleaved	-	-	Aini/Koko	Wildjack or Jungle Jack	no	no	no	no
24	Castonopsis spp.	Broadleaved	Sokay	Tshai shing	Katus	chinquapin or chinkapin	Yes	Yes	Yes	Yes
25	Cinnimomum obtusifolium	Broadleaved	-	-	Gansarai	Cinnamom tree	yes	yes	yes	yes
26	Garuga pinnata	Broadleaved	-	-	Dabdabe	Garuga	No	No	No	No
27	Lagerstroemia spp.	Broadleaved	-	-	Sidha	Pride of India or Queen Crape Myrtle	Yes	Yes	Yes	Yes
28	Machilus spp	Broadleaved	-	-	Kawla	-	Yes	Yes	Yes	Yes
29	Nyssa javanica	Broadleaved	-	-	Lekh chailauna	-	Yes	Yes	Yes	Yes
30	Prunus nepalensis	Broadleaved	-	-	Arupata	Prunus	Yes	Yes	Yes	Yes
31	Pterospermum acerifolium	Broadleaved	-	-	Hathipaile	Dinner plate tree, Maple leafed Bayur tree, Bayur tree	Yes	Yes	Yes	Yes
32	Sterculia villosa	Boardleaved	-	Frang shing	Odal	Elephant Rope tree	No	No	No	No

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Sl. No	Scientific Name	Timber Type	Local Name				Use			
			Dzongkha	Sharchhop	Lhotsham	English	Door & Window (Shutter)	Door & Window (Frame)	Flooring	Panelling
33	Syzygium spp.	Broadleaved	-	Mentsu say shing	Jamun/Ambake	Jamun tree	Yes	Yes	Yes	Yes
34	Tetrameles nudiflora	Broadleaved	-	-	Maina	Tetrameles	No	No	No	No
35	Quercus spp.	Broadleaved	Bjishing	-	-	Oak	Yes	Yes	Yes	Yes

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## WOOD AND TIMBER PRODUCTS TECHNICAL COMMITTEE (TC 07)

### *Organization*

Forest Resource Division,  
Natural Resources Development Corporation Limited

Bhutan Board Products Limited

Wood Craft Centre Limited

Department of Forests and Park Services  
Ministry of Agriculture and Forest

Association of Wood based Industries

Department of Engineering Services,  
Ministry of Works & Human Settlement

Department of Engineering Services,  
Ministry of Works & Human Settlement

Thimphu Thromde

Bhutan Standards Bureau

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Mr. Tashi Norbu Waiba

Mr. Sangay Gyeltshen

Mr. Karma Tenzin

Mr. Tshering Norbu

Mr. Sonam Tshering

Mr. Sherab Tenzin,  
Director General  
(Ex-officio member)

#### **Member Secretary**

Chenzom  
Standardization Division  
Bhutan Standards Bureau

#### **Member Secretary**

Standardization Division  
Bhutan Standards Bureau

**TIMBER DOORS AND WINDOWS SUB-COMMITTEE (TC-07/SC-02)**

***Organization***

Department of Engineering Services,  
Ministry of Works & Human Settlement

Thimphu Thromde

Department of Engineering Services,  
Ministry of Works & Human Settlement

Ongdi Timber Industries

***Representative(s)***

**(Chairperson)**

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Mr. Sonam Tshering

Mr. Karma Tenzin

Mr. Jigme Wangchuk

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