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DRAFT EAST AFRICAN STANDARD

Wooden flush door shutters of cellular and hollow core type — Specification for — Part 1: Plywood face panels

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards. XXXXXX.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC: 022,

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Wooden flush door shutters of cellular and hollow core type — Specification — Part 1: Plywood face panels

1 Scope

This Draft East Africa Standard specifies requirements, sampling and test methods of cellular and hollow core wooden flush door shutters with face panels of plywood or cross-band and face veneers.

2 Normative references

The following referenced documents referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13608, Specification for veneered decorative plywood

EAS 324, Copper/chromium/arsenic compositions for the preservation of timber — Method for timber treatment

ISO 1804, Doors — Terminology

ISO 16893, Wood-based panels — Particleboard

EAS 24, Timber industry — Glossary of terms

3 Terms and definitions

For the purposes of this document, the following terms and definitions in EAS 24 and ISO 1804 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Requirements

4.1 Types and designation

Cellular or hollow core flush door shutters shall be of the decorative type or non-decorative (paintable) type. The nature of construction of these shutters shall, therefore, be specified based on the type and construction of core as given in Table 1.

Table 1 — Nature of construction of wooden flush door shutter (cellular and hollow core type)

Core	Type	Abbreviations
Cellular	Decorative	CD
	Non-decorative	CN
Hollow	Decorative	HD
	Non-decorative	HN

4.2 Size and tolerance

4.2.1 Sizes of the wooden flush door shutters shall generally conform to the modular sizes specified in Table 2 (see Figure 1). Sizes other than modular sizes, as agreed to between the manufacturer and the purchaser, may also be permitted; however, the thickness of shutters in such cases shall not be less than that specified against the nearest higher modular size given in 4.2.3.

Table 2 — Dimensions of wooden flush door shutters

Designation of doors	Width mm	Height mm	
		min.	max.
8 DS 20	710	1 945	1 945
8 DS 21	760	1 980	2 045
9 DS 20	810	2 005	2 030
9 DS21	860	2 005	2 030
10 DS 20	900	2 005	2 100
10 DS 21	915	2 005	2 100
12 DT 20	1 100	1 905	2 100
12 DT 21	1 500	2 005	2 100

NOTE 1 D - Door, S - Single shutter, and T - Double shutter.

NOTE 2 The designation indicates the size of door openings, the first number referring to width in modules of 100 mm and the last number is the height in modules.

NOTE 3 In arriving at the standard widths and height for wooden flush doors shutters, an allowance of 60 mm has been made for door frames, 40 mm for floor finish and 5 mm for clearance all round (see Figure. 1) between door opening and door frame and 15 mm for rebate all round for the shutter into the frame.

4.2.2 In case the modular height is taken from the finished floor level, the height of the wooden flush door shutters shall be the one given in column 3 of Table 2 for maximum height. In the case of double shutters, the rebate and clearance between the shutters shall be as given in 4.4.7.

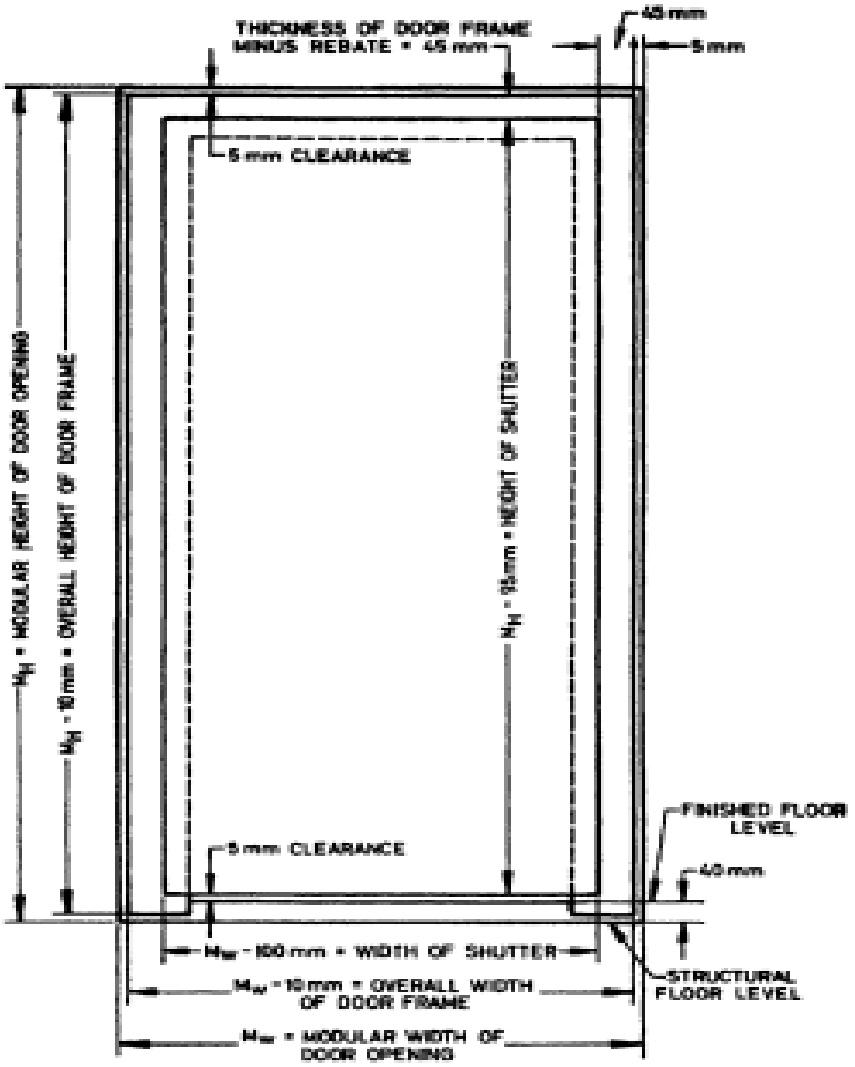


Figure 1 — Sketch illustrating dimensions of wooden flush door shutter

4.2.3 Nominal thickness of shutter shall be 25 mm, 35 mm, 38 mm, 40 mm, 45 mm or 50 mm.

4.2.4 It is recommended that as far as possible the thickness adopted for flush door should be as given in Table 3.

Table 3 — Thickness of wooden flush door shutters

Wooden flush door designation	Thickness mm
8 DS 20 and 8 DS 21	25 or 35
9 DS 20 and 9 DS 21	38
10 DS 20 and 10 DS 21	40
12 DT 20 and 12 DT 21	45 or 50

4.2.5 Tolerances shall:

a) on nominal width and height, be +3 and -0 mm ; and

b) on nominal thickness, be ± 1.2 mm.

The thickness of the wooden flush door shutter shall be uniform throughout with a permissible variation of not more than 0.8 mm when measured at any two points.

4.3 Materials

4.3.1 General

All plywood, cross-bands and veneers used shall be treated in accordance with 4.3.2.5 b) and 4.3.2.5 c).

4.3.2 Timber

4.3.2.1 The timber for use in the core of wooden flush door shutters shall be of suitable hardwood and/or softwood species.

4.3.2.2 For stiles, rails and lipping only suitable timber species shall be used.

NOTE The suitability of timber for stiles, rails and lipping is normally based on the screw holding properties of the timber. However, in the absence of detailed data relating to screw holding properties of the species, the density of the species and the data relating to screw holding properties can be used.

4.3.2.3 The moisture content in timber used in the manufacture of wooden flush door shutters shall not be more than 12 %.

4.3.2.4 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 pockets, pitch streaks and harmless pin-holes shall be permissible except in the exposed edges of the core where members shall be cut out and filled in with carefully fitted glued pieces of wood of similar species and character with their grain running in the same direction.

4.3.2.5 Timber and sapwood shall be preservative-treated before assembly as specified below:

a) trimmed and cut ends shall be given a protective treatment by brush or spray application;

b) for preservative treatment, the timber shall be treated in accordance with EAS 324; and

c) timber shall be stacked for at least half an hour before drying.

Timber should be dried to a suitable moisture content before bonding.

4.3.3 Plywood

4.3.3.1 Commercial plywood used in wooden flush door shutters shall be Boil Weather Proof (BWP) grade at least Type BC.

4.3.3.2 Decorative plywood used in wooden flush door shutters shall conform to Grade 1 of ISO 13608.

4.3.4 Cross-bands

Cross-bands used in wooden flush door shutters shall conform to the requirements laid down for BWP grade plywood.

4.3.5 Face veneers

4.3.5.1 Commercial face veneers used in wooden flush door shutters shall conform to the requirements laid down for veneers for BWP grade plywood.

4.3.5.2 Decorative face veneers used in wooden flush door shutters shall conform to the requirements of decorative veneers specified for Grade 1 decorative plywood.

4.3.6 Adhesive

Adhesive used shall be phenol formaldehyde synthetic or any other suitable adhesives conforming to Boil Weather Proof (BWP) type.

4.3.7 Particleboard

Particleboards used for the core of the wooden flush doors shall be either flat platen pressed or extrusion pressed type conforming to ISO 16893 and shall be made using phenol formaldehyde adhesive or any other suitable adhesives. The swelling of the particleboards in thickness and length when tested shall not exceed 5 %.

4.4 Construction

4.4.1 Cellular core

Timber frame for holding the core shall be constructed from stiles; and top and bottom rails, each not less than 75 mm wide including concealed lipping where provided. The cellular core shall be of any of the following types of construction as specified by the purchaser:

a) Type A: particleboard, hardboard, wooden or plywood battens, tubular, strips of blocks or battens strips of not less than 25 mm in width so fixed that each of the voids formed does not exceed 25 cm^2 in area and the volumetric contents of the voids do not exceed 50 % of the total core volume, that is, when measured from edge to edge; or

b) Type B: rolls, strips, coils or corrugation of veneers not less than 1 mm thick and not less than 100 mm in length (when fully flat), so fixed that the distance between any two faces of the rolls, strips, coils or corrugations, at any place is such that at least one strip is intercepted by a square of side 200 mm in any position.

The voids shall be uniformly distributed throughout the core (see Figure 2).

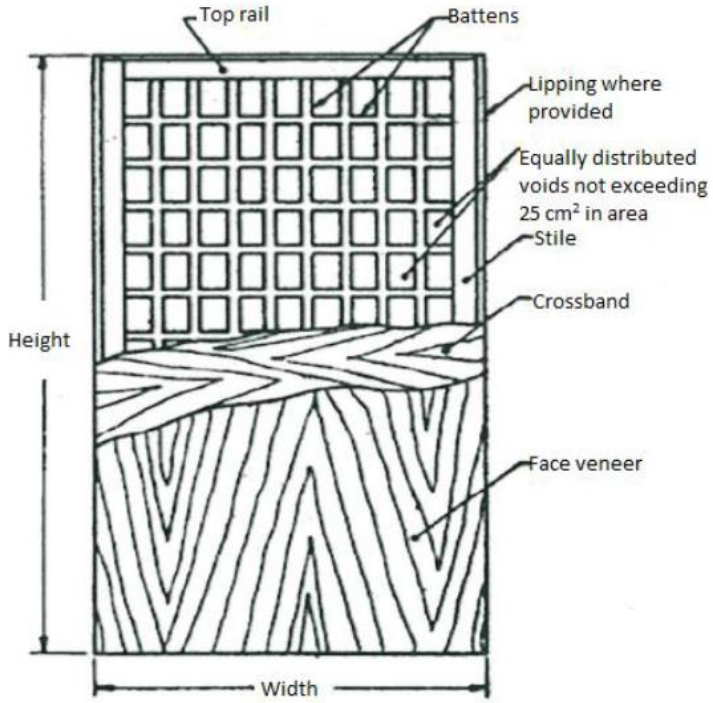


Figure 2 — Cellular core flush door shutter (Width and Height in accordance with Table 2)

4.4.2 Hollow core

The timber frame for holding the core shall be constructed from stiles and top, bottom and minimum two intermediate rails, each not less than 75 mm wide including concealed lipping where provided as shown in Figure 3. In. each segment, battens not less than 25 mm wide shall be fixed in such a way that the voids are equally distributed and the void area in any segment is less than 500 cm^2. Battens may also be replaced by suitable rolls or strips of veneers.

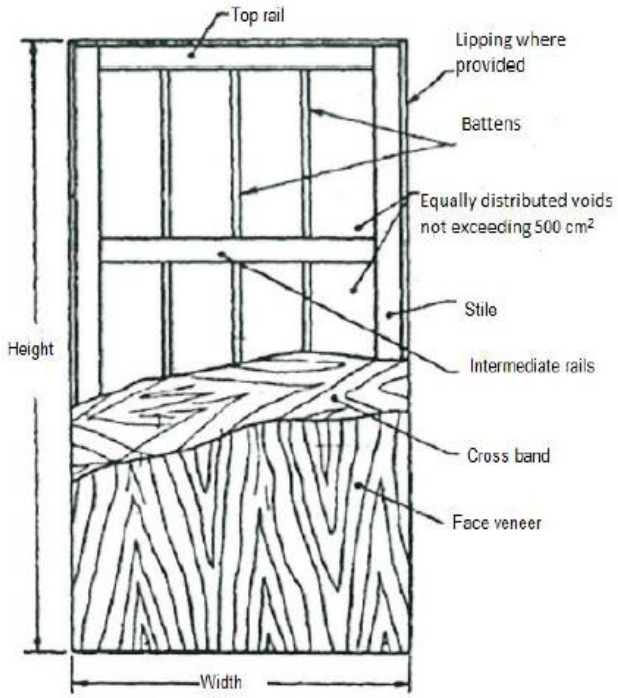


Figure 3 — Hollow core flush door shutter (Width and Height in accordance with Table 2)

4.4.3 Stiles and rails

Stiles and rails of wooden flush door shutters shall be of one-piece construction or laminated one-piece construction using BWP type of adhesive. Butt (end) joints shall not be permitted for making-up the length of the frame.

4.4.4 Levelling

Levelling of surface (not necessarily by planning) shall be carried out during each stage of construction, that is; fabrication of core and bonding of the plywood. Thickness of the core, shall be checked for uniformity before bonding the cross-bands and face veneers as the case may be.

4.4.5 Face panel

4.4.5.1 The plywood forming the face panel shall not be less than 3 mm in thickness in the case of cellular core flush door shutters, and not less than 6 mm in thickness in the case of hollow core flush door shutters except for 25 mm thick door in which case 4 mm thickness may also be permitted. Two-ply face skin construction in a combination of cross-band and face veneers may also be adopted for cellular core flush door shutters only but in that case, the combined thickness of one cross-band and one face veneer shall not be less than 4 mm. The thickness of the face veneers in the plywood shall be between 0.5 mm and 1.5 mm for commercial veneers and between 0.5 mm and 1.0 mm for decorative veneers. The plywood face skin assembly, conforming to these requirements shall be glued under pressure on both faces of the core.

4.4.5.2 Application of a decorative face veneer on a finished face panel having veneer in the same direction as the proposed veneer shall be avoided. However, where this is unavoidable due to special circumstances, the already existing veneer, whether commercial or decorative, shall be so sanded that the total thickness of both the existing and applied face veneers together shall not exceed the maximum thickness specified, and provided that the thickness of decorative veneer is in no case less than 0.5 mm.

4.4.6 Lipping

4.4.6.1 General

Lipping shall be provided on wooden flush door shutters. Lipping shall be concealed and designated as edge-band; or exposed as specified by the purchaser. Joints shall not be permitted in the lipping.

4.4.6.2 Edge-band/internal lipping

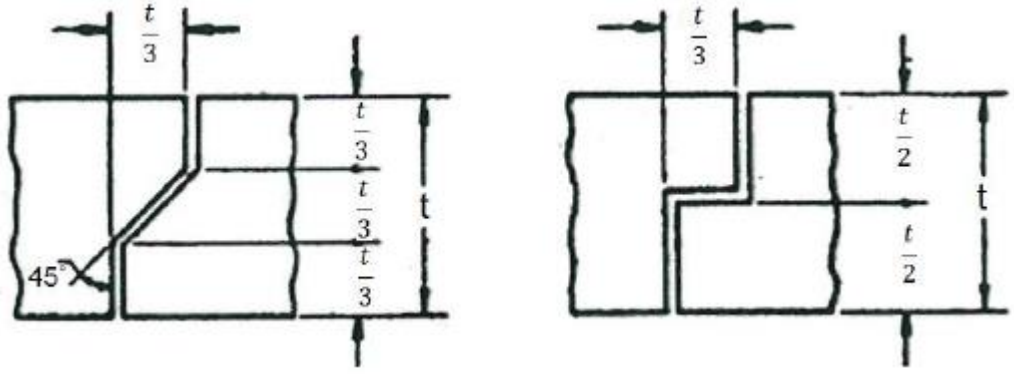
Edge-band/concealed lipping shall have a total depth of not less than 25 mm. Edge-band, may be provided separately, when it is of a species different from that of backing, or as one piece with the stile, designated as frame-cum-lipping, when edge band and backing are of the same species. The overall width shall be as given in 4.4.1 unless specifically asked for by the purchaser.

4.4.6.3 External lipping

Where provided, shall be solid and measure at least 6 mm on the face of the door.

4.4.7 Rebating

In the case of double-leaved wooden flush door shutters, the meeting of the stiles shall be rebated by one-third the thickness of shutter. The rebating shall be either splayed or square type as shown in Figure 4. Where lipping is provided, the depth of lipping at the meeting of stiles shall not be less than 35 mm.



a) Splayed type b) Square type

Figure 4 — Meeting of stiles for double-leaved door shutters

Where

t thickness of shutter.

4.4.8 Opening for glazing

When required by the purchaser, opening for glazing shall be provided and unless otherwise specified, the opening provided shall be 250 mm in height and 200 mm in width. Unless otherwise specified by the purchaser, the bottom of the opening shall be at a height of 1400 mm from the bottom of the shutter as shown in Figure 4, for which the glazing shall be lipped internally with solid timber opening.

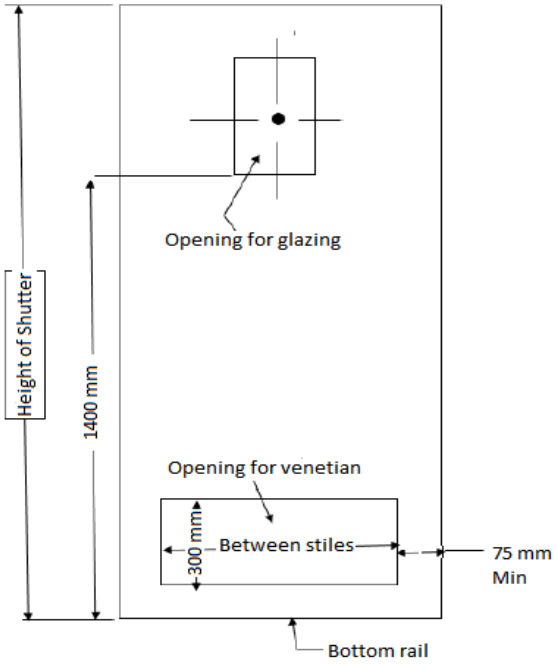


Figure 4 — Typical location of openings for glazing and Venetian

4.4.9 Venetian

When required by the purchaser, a Venetian opening shall be provided and unless otherwise specified, the height of the opening shall be 30 cm from the top of the bottom rail. The width of' the opening shall be as

specified by the purchaser but shall provide a clear space of at least 75 mm between the edge of the door and the venetian opening.

4.5 Fitting of locks

Wooden flush door shutters shall be shop-prepared for taking mortice locks or latches as may be ordered. Shop-prepared wooden flush door shutters with morticed holes for lock fixing shall be done only when desired by the purchaser. Where the purchaser so desires, suitable blocks of wood may be provided for fixing the hardware.

4.6 Workmanship and finish

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

4.6.2 Both faces of wooden flush door shutter shall be sanded to a smooth even texture. If required by the purchaser, all surfaces of wooden flush door shutters which are required to be painted shall be covered evenly by painting with a priming coat of primer. In the case where shutters are to be polished or varnished, a priming coat of suitable polish or varnish shall be given before delivery. However, only unpainted doors shall be subjected to the tests mentioned in Clause 5.

4.6.3 Workmanship and finish of the face panels shall be of commercial type and decorative type.

5 Test methods

5.1 End immersion test

Wooden flush door shutters shall be tested for resistance of their base to immersion in water. The door shutter shall be immersed vertically to a height of 30 cm in water at room temperature of 27 °C ± 2 °C and relative humidity of 65 % ± 5 % for 24 h and then allowed to dry for 24 h. The cycle shall be repeated eight times. There shall be no delamination at the end of the test.

5.2 Knife test

The face panel, when tested shall pass the test.

5.3 Adhesion test

5.3.1 The wooden flush door shall be tested for adhesion in accordance with 5.3.2

5.3.2 Two square sections, 150 mm x 150 mm shall be cut from the corners of the door. These corner sections, as cut from the door, shall be immersed in boiling water at 100 °C for four hours, then dried at 27 °C ± 2 °C and relative humidity of 65 % ± 5 % for 24 h. At the end of the drying period, the samples shall be examined for delamination. Glue lines in all the four exposed edges of the plywood on both faces of a specimen and the glue lines between the plywood faces and the stile and rail shall be examined for delamination.

5.3.3 A specimen shall be considered to have passed the test if no delamination has occurred in the glue lines in the plywood and if no single delamination more than 50 mm in length and more than 3 mm in depth has occurred in the assembly glue lines between the plywood faces and, the stile and rail. Delamination at the corner shall be measured continuously around the corner. Delamination at a knot, hole, pitch pocket, worm hole, or other permissible wood defects shall not be considered in assessing the sample. A door shall be deemed to have passed this test if both the specimens tested pass the test.

5.4 Type tests

The manufacturer may also have the performance test of the flush door tested by the type tests. The type tests shall only apply to the specific design of the flush door and need not be applied as routine tests.

6 Sampling and criteria for conformity

6.1 Type tests

6.1.1 The manufacturer shall get the type tests done on at least three samples by the standard test methods of specified in 5.4.

6.1.2 The manufacturer shall, on the request of the purchaser, give free of charge, the type test certificate regarding type, construction and finish of the wooden flush door shutters.

6.2 Sampling and acceptance tests

6.2.1 All wooden flush door shutters of the same type and manufactured under similar conditions of production shall be grouped together to constitute a lot.

6.2.2 The number of wooden flush door shutters to be selected at random from a lot shall depend upon its size and shall be in accordance with column 1 and 2 of Table 4.

Table 4 — Sample size and criteria for conformity

Lot size		Sample size defective	Permissible number of defective samples	Sub sample size
Min	Max			
26	50	8	0	1
51	100	13	1	2
101	150	20	1	2
151	300	32	1	3
301	500	50	2	4
501	and above	80	2	5

6.2.3 Number and tests of wooden flush door shutters to be carried out shall be in accordance with 6.2.3.1 and 6.2.3.2.

6.2.3.1 The wooden flush door shutters selected as in 6.2.2 shall be inspected for dimensions and workmanship and finish.

6.2.3.2 One end of the shutter shall be tested for using end immersion test. Two samples of 150 mm x 150 mm shall be cut from the two corners at the other end for carrying out glue adhesion test. The knife test shall be done on the remaining portion of the flush door shutter. The number of shutters for these tests shall be in accordance with column 4 of Table 4 and shall be selected from those found satisfactory when inspected as-in 6.2.3.1.

6.3 Criteria for conformity

6.3.1 The lot shall be considered as conforming to the requirements of this standard, if conditions laid down in 6.3.2 and 6.3.3 are satisfied.

6.3.2 The number of wooden flush door shutters failing to satisfy the requirements of any characteristic mentioned in 6.2.3.1 shall not exceed the permissible number mentioned in column 3 of Table 4.

6.3.3 All the wooden flush door shutters when tested according to 4.6, shall satisfy the requirements of the tests. If the number of shutters found unsatisfactory for a test is one, twice the number of shutters initially tested shall be selected and tested for that test.

All the shutters so tested shall satisfy the requirements of the test. If the number of shutters found unsatisfactory for a test is two or more, the lot shall be considered as unsatisfactory.

7 Marking

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

a) name of the manufacturer and trademark, if any;

b) abbreviation indicating the nature of construction of the shutter;

c) whether the size of the shutter is ‘Modular’ or ‘Non-modular’;

d) designation for modular sizes; or the actual size (width and. height) for modular sizes along with appropriate symbols for flush door shutters;

e) thickness of door shutters; and

f) products complying with requirements of this standard shall be marked with a number for this standard

Bibliography

[1] US 1657-1:2017, Wooden flush door shutters — Specification for cellular and hollow core type — Part 1: Plywood face panels

