DEAS 1067:2021

ICS 91.060.50.

DRAFT EAST AFRICAN STANDARD

General wooden door shutters — Specification

EAST AFRICAN COMMUNITY

First Edition 2021

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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.

General wooden door shutters — Specification

1 Scope

This Draft East Africa Standard specifies requirements, sampling and test methods for wooden door shutters of three exposure classes and three performance classes.

This specification does not cover the requirements for fire doors.

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 6445, Doors -- Behaviour between two different climates -- Test method

ISO 7894, Partitions made of components -- Test for resistance to wind (static pressure and slamming doors

ISO 8270, Door sets — Soft heavy body impact test

ISO 12777-3, Methods of test for pallet joints -- Part 3: Determination of strength of pallet joints

EAS 272, Timber — Determination of moisture content for physical and mechanical tests

ISO 6443, Door leaves — Method for measurement of height, width, thickness and Squareness

ISO 8271, Door leaves — Determination of the resistance to hard body impact

ISO 9380, Door sets — Repeated torsion test

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

3.1
acceptable
meets stakeholder expectations that are capable of being shown as reasonable or merited

3.2
balanced door
door with the stile structure and face and back which are so designed that either edge of the door can be used as the hanging edge or the lock edge, and either end of the door can be used as the top or the bottom [see Figure 1(a)]

3.3
batten door
door with the face which consists of strips of wood. Batten doors have the following constructional variations:

3.3.1
balanced
door that has a core or frame, and matching battens on both faces of the door [see Figure 1(b)]

3.3.2
flush back
door that has a batten face and a flush back [see Figure 1(c)]

3.3.3
framed and ledged (f&l door)
door that has face battens on or in a frame, with various patterns of ledges and rails on the back

3.3.4
framed, ledged and braced (fl&b door)
door that has face battens in a frame, with various patterns of ledges, rails and braces on the back

3.3.5
ledged and braced (l&b door)
door that has face battens joined by back ledges and a brace(s) [see Figure 1 (d)]

NOTE Face battens may be arranged vertically, horizontally, at angles, or in a herringbone or other pattern.

3.4
casement door
door in which the area within the frame is glazed with one or more glass panels [see Figure 1(e)]

3.5
cladding
outer flush surface of the front or back of a door, usually consisting of a board product, not necessarily veneered

3.6
closing block
solid block, in the top part of a door core, into which closing mechanism screws may be fixed

3.7
combination door
door that is a combination of door types, for example, a panel door with the top half glazed as in a casement door

3.8
core filler
evenly distributed inner structure of a flush door that fills or partly fills the space between the core frame components and that rigidly supports the door cladding in a true plane

3.9
cupboard door
door of thickness in the range 20 mm - 40 mm, and that is designed to fit into a cupboard door frame

3.10
custom-made door
door that is non-standard in size or design [see Figure 1(f)]

NOTE Custom-made doors are not covered in detail by this specification.

3.11
door frame
frame into which a door is fitted

3.12
double-leaf door/double door
door that has two leaves (a left-hand one and a right-hand one) [see Figure 1(g)]

3.13
dwarf door
door whose dimensions are smaller than the smallest standard dimensions given in Table 2

3.14
face
surface of a door that is first seen by a person entering a building or room

3.15
flush door
door whose two major surfaces are generally flushed, but that may have moulded surface features or glazed panels, and that consists of claddings bonded to stiles, rails and a core filler [see Figure 1(i)]

3.16
hinge block
solid part in a door core into which the hinge screws may be fixed

3.17
lipping
strip of paper or veneer so fixed to the edge of a door that it completely conceals the framing

3.18
lock block
solid part in a door core into which a lock may be fitted

3.19
louvre door
door that has slats (usually running horizontally) so spaced as to afford ventilation

3.20
meeting stile
stiles of a double door that meet when the door is closed

3.21
panel door
door in which the area within the frame is panelled with one or more panels

3.22
pre-hung door
door supplied in a frame and intended for installation without any trimming or carpentry

3.23
screen door
door covered with wire mesh, gauze, expanded metal, or a combination of these

NOTE A screen door is intended for use together with an exterior door, and allows the passage of air into a building without letting in insects or blown debris.

3.24
security-view door
medium or heavy duty performance class door that allows communication with a visitor while preventing entry

3.25
sliding door
door that typically consists of one or more leaves which open and close by means of a horizontal sliding action

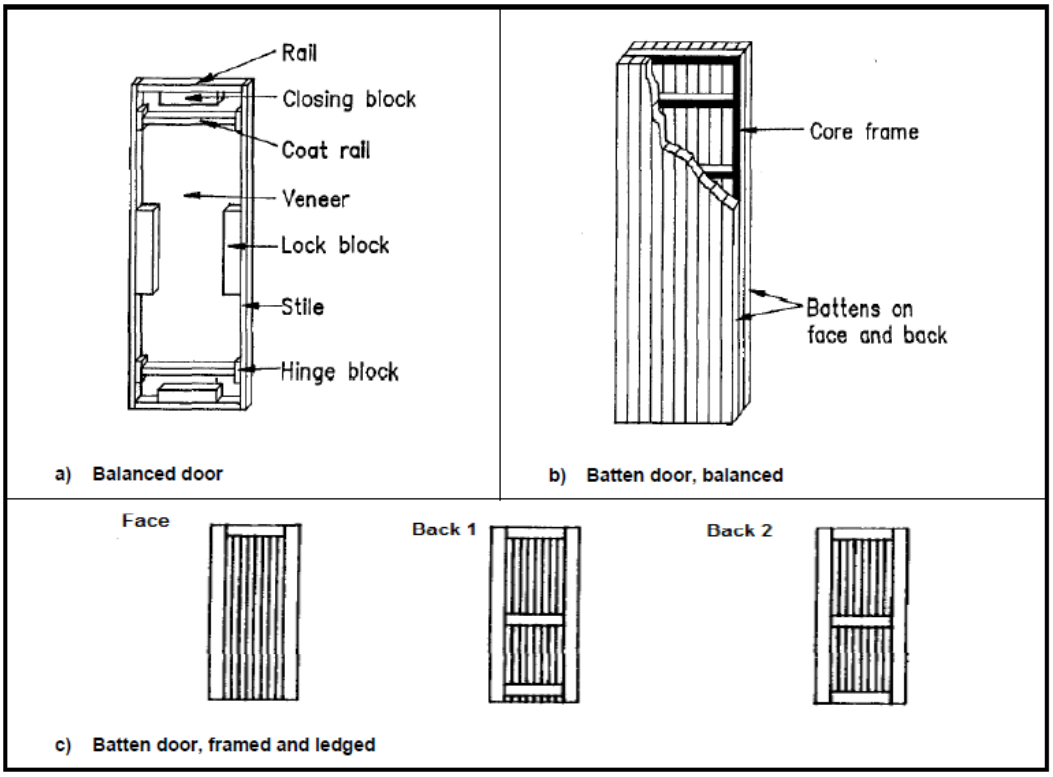
3.26
stable door
door that consists of a top and a bottom leaf, where the top leaf can be opened independently of the bottom leaf

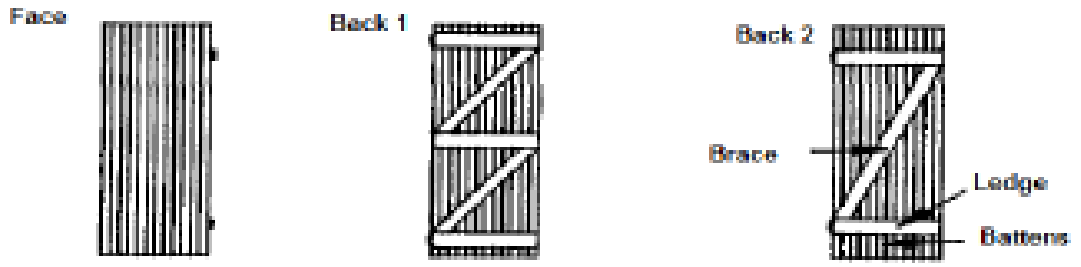
3.27
telegraphing
appearance of outlines of the door components through the sheeting that forms the face of the door

3.28
warp
any departure from a true or plane surface of a door (in the form of a cup, bow, spring or twist, or any combination of these)

3.29
width of clear doorway opening
width of the opening left in a doorway when the fitted door is fully open

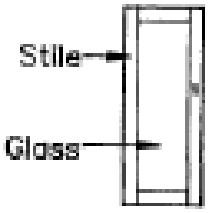
3.30
x-ray attenuating door
door that has a lining of lead to block the passage of radiation generated by X-ray equipment



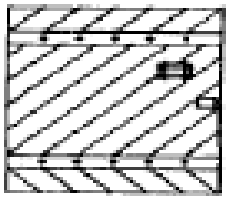


NOTE Brace runs upward, away from hinges

d) Batten door, ledged and braced

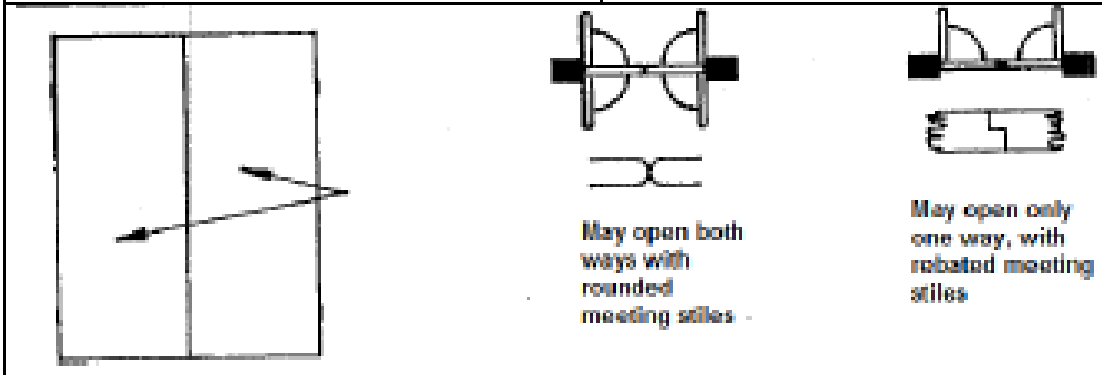


e) Casement door

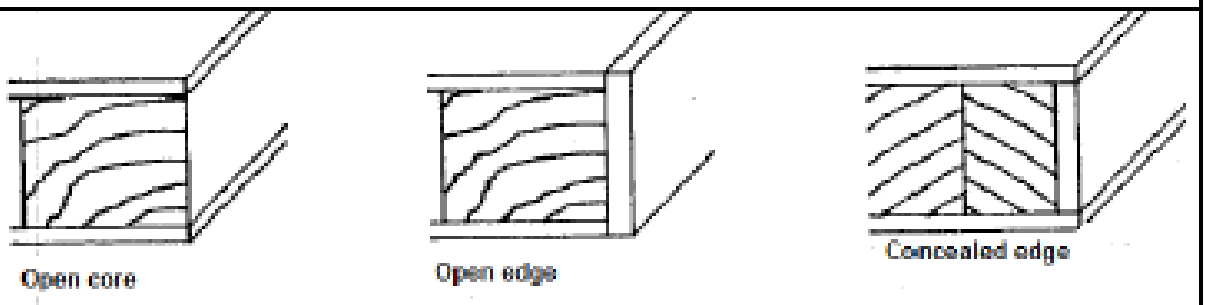


Usually nonstandard size; Materials and construction as required

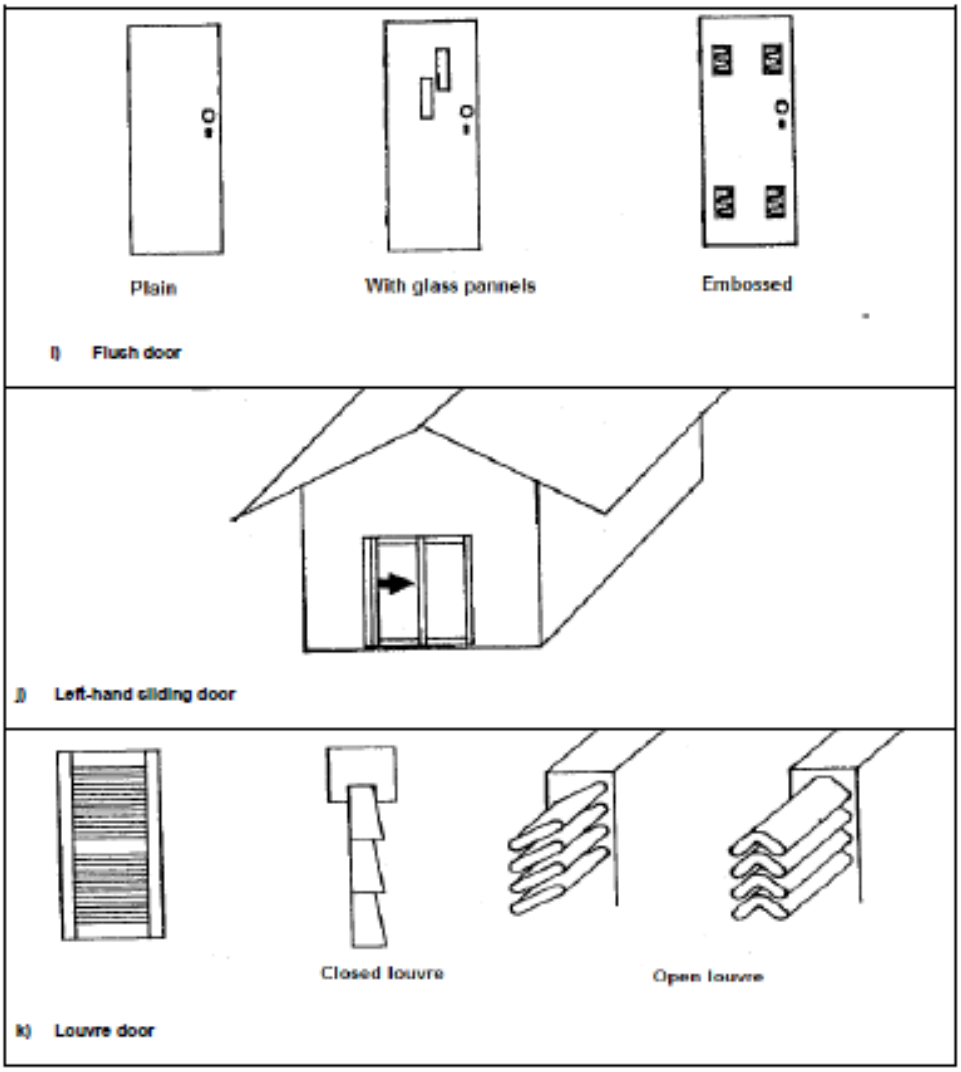
f) Custom-made door



g) Double-leaf door



h) Door edges



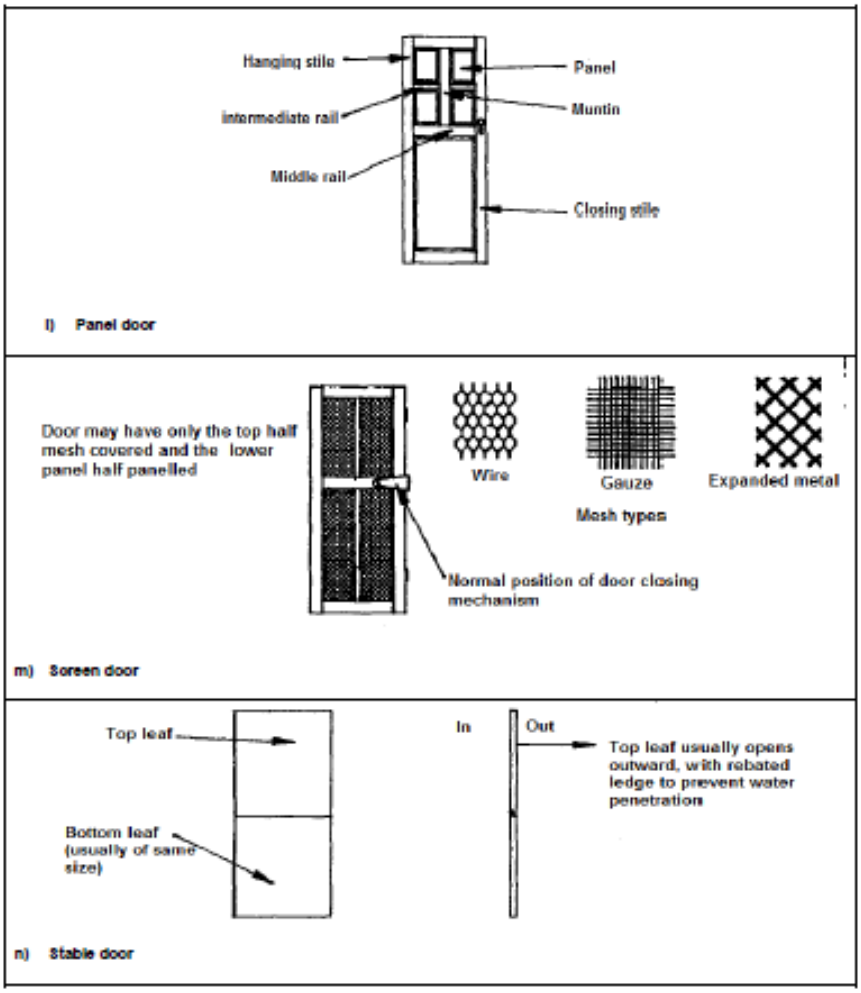


Figure 1 — Types of doors (typical)

4 Requirements

4.1 Types

A door shall be of the type that is acceptable (see 3.1) and shall conform to the requirements give in 4.7.

4.2 Exposure class

A door shall be of one of the exposure classes given in Table 1, as required. The exposure class of a door shall be the same as the exposure class of the adhesives used in the construction of the door.

Table 1 — Exposure class and conditions of exposure for wooden door shutters

Exposure class (and application)	Conditions of exposure
Class 1 (Exterior)	Constantly exposed to unprotected open-air conditions
Class 2 (Semi-exterior)	At infrequent intervals exposed (partly or as a whole) to unprotected open-air conditions
Class 4 (Dry interior)	Exposed to dry sheltered (indoor) conditions only

4.3 Materials

4.3.1 General

Materials used in the construction of a wooden door shall conform to the requirements given in 4.3.2 and 4.3.3, as required.

4.3.2 Timber

Timber shall be of the required species and shall be free from decay and insect damage (other than that caused by Ambrosia) and the moisture content of the timber, when tested in accordance with EAS 272, shall not exceed 12%.

4.3.3 Other materials

Any other materials used shall be such as to be acceptable (see 3.1).

4.4 Components

4.4.1 Glued structural joints (joinery doors)

The joints of a door shall be of acceptable appearance, and any bond lines or gaps in the joints shall not exceed 1 mm in width. Openings between members of a joint shall be acceptably filled with an acceptable filler. Bonded joints shall be fully and continuously bonded and shall show no delamination.

4.4.2 Hinge blocks and lock blocks

Balanced doors shall have hinge blocks and lock blocks of timber or other acceptable material (see Figure 2). The position of the lock block in an unbalanced door shall be indicated by markings or shall be as given in Figure 2.

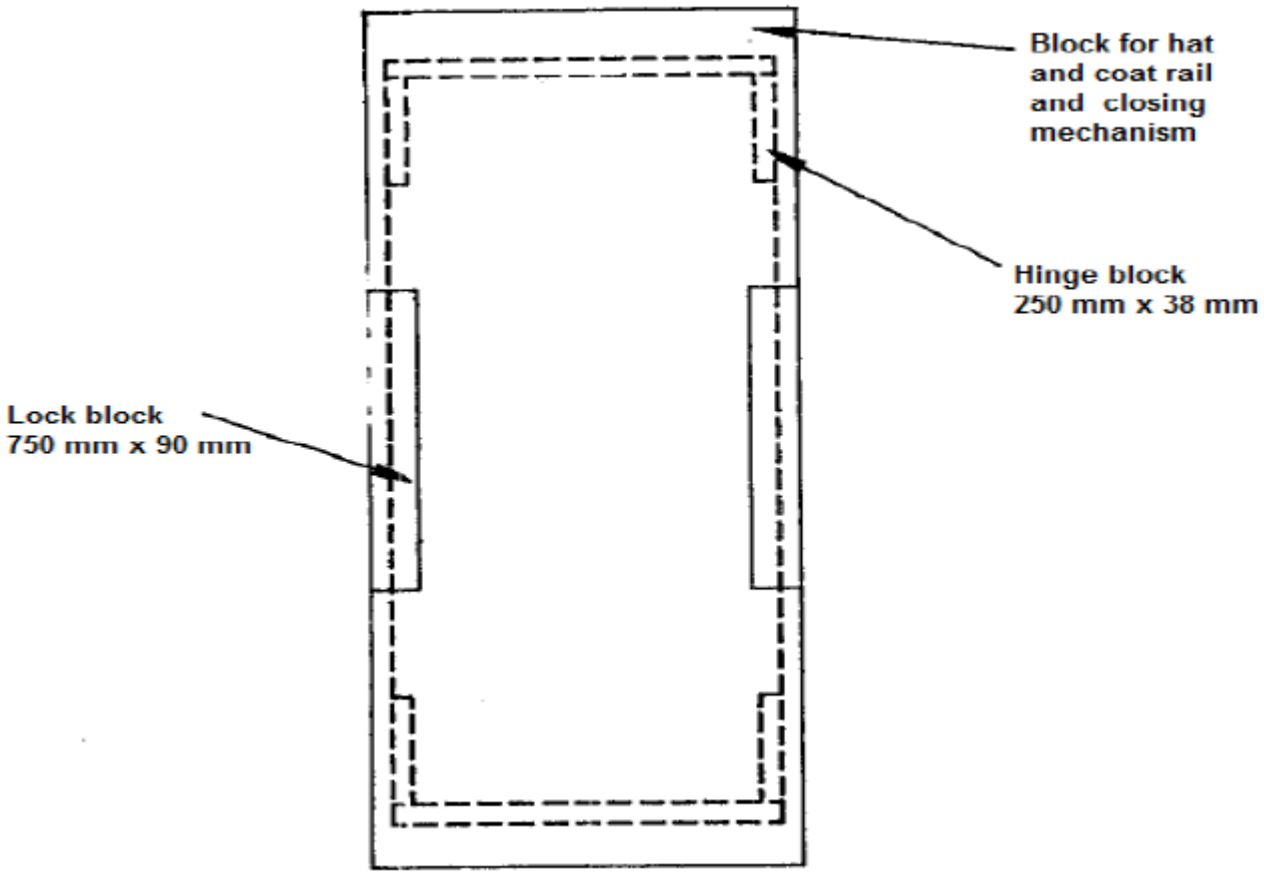


Figure 2 — Door component arrangement

NOTE It is not advisable to put hinge blocks and lock blocks into doors of dimensions smaller than the standard dimensions given in Table 2.

4.4.3 Stiles

All stiles intended to be fitted with locks shall be of a width sufficient to accommodate the locks; lock recesses shall not weaken any joints.

This requirement does not apply to dwarf doors.

4.4.4 Door edges

4.4.4.1 Trimming

Provision shall be made for trimming at least 10 mm off each open-faced stile of a door and for trimming a maximum of 10 mm off each top and bottom rail. Timber edges shall be of sufficient thickness to allow for trimming off a maximum of 3 mm.

4.4.4.2 Finish

The edges of a door shall be as required but edges and lipping shall show no knot-holes, loose knots or splits. All edges and lippings shall be bonded over the entire surface.

4.4.5 Coat rails and closing blocks

The size(s) and position(s) of coat rails and closing blocks in the door construction shall be as required and shall be such as to be acceptable.

NOTE It is recommended that if door-closing mechanisms are to be fitted, heavy duty doors be used.

4.5 Dimensions

4.5.1 Standard dimensions

The dimensions of wooden door shutters shall be as specified in Table 2.

Table 2 — Standard door dimensions and tolerances

Dimension	Standard dimensions mm	Tolerance
Height	*457, 2 032	± 2
Width	+610, 762, 813, 868	± 2
Thickness	*28, *35, 40,	± 1.5
	42	± 1

NOTE It is preferable that doors of exposure class 1 be of thickness of at least 42 mm.

* For cupboard doors

\+ For double-leaf doors

4.5.2 Squareness

The difference in length of diagonals, when tested in accordance with ISO 6443, shall not exceed 5 mm.

4.5.3 Warp

The deviation from absolute flatness at any point on a door, when measured shall not exceed 3 mm/m.

4.6 Performance requirements

4.6.1 Performance class

A door shall be of one of the following performance classes, as required:

a) Light Duty Door (LDD); a door that is usually intended for interior use;

b) Medium Duty Door (MDD); a door whose performance properties are between those of heavy duty and those of light duty doors; and

c) Heavy Duty Door (HDD); a door that is intended for use in areas of frequent use and abuse.

NOTE Heavy duty doors are typically used as exterior doors in high-occupancy buildings such as schools, public buildings, hotels and hospitals.

4.6.2 Performance

A door shall comply with the applicable performance requirements given in Table 3 and their application given in Table 4.

Table 3 — Performance requirements for doors

Property	Performance class requirement			Test method subsection
	HDD	MDD	LDD	
a) Stiffness*§ • Permanent deflection, mm, max.	2	2	2	ISO 12777-3
b) Resistance to torsion*#§ • Permanent deflection, mm, max.	6	5	3	US ISO 9380
c) Resistance to hard body impact+ • Height of fall, mm, min.	300	300	250	US ISO 8271
d) Resistance to soft body impact*§ • Height of fall, mm, min.	300	300	250	ISO 8270
e) Resistance to slamming*// • Number of slams, min.	750	300	100	ISO 7894
f) Resistance to weathering*	-	-	-	ISO 6445

The door shall not sag onto the test frame

+ There shall be no penetration up to the shoulder of the impact ball and no sign of delamination or damage to the joints or components

* There shall be no visible sign of damage to the door

§ In the case of stable doors, the top and bottom leaf shall be tested separately

// An the case of stable doors the top leaf shall slam against the bottom leaf and test frame, and the bottom leaf shall slam against the top leaf and test frame

There shall be no visible sign of damage to the door. There shall be no penetration up to the shoulder of the impact ball and no sign of delamination or damage to the joints or components.

Table 4 — Application performance requirements for door types (see also Table 3)

Door type	Performance class	Applicable performance requirement on resistance to:					
		Stiffness	Torsion	Hard body impact	Soft body impact	Slamming	Weathering
Combination of glazed and panelled/unframed batten/framed batten/flush/ panel/patterned	HDD, MDD and LDD	X	X	X	X	X	In accordance with exposure class
Casement	LDD	NA	NA	NA	NA	X	NA
Cupboard	LDD	X	X	X	X	X	NA
Louvre	LDD	NA	NA	NA	NA	X	NA
Screen	LDD	NA	NA	NA	NA	X	In accordance with exposure class
Stable	HDD and MDD	X	X	NA	X	X	In accordance with exposure class
NOTE 1 X indicates applicable requirements							

NOTE 2 NA= Not applicable

In the case of stable doors the top leaf shall slam against the bottom leaf and test frame, and the bottom leaf shall slam against the top leaf and test frame.

4.7 Requirements for specific types of doors

4.7.1 General

Types of doors shall comply with the specific requirements given in 4.7.2 to 4.7.9 of this standard.

4.7.2 Batten doors

The joints between battens shall be acceptable and the warp from a batten to the adjacent batten or component shall not exceed 1 mm. Batten doors shall preferably be protected against moisture [see Figure 1(b) to Figure (d)].

4.7.3 Casement doors

A door in which the area within the frame is glazed with one or more glass panels, the type, arrangement and method of fitting glazing shall be such be acceptable [see Figure 1 (e)].

4.7.4 Pre-hung doors

Pre-hung doors shall be such that no trimming is required.

4.7.5 Security-view doors

Security-view doors shall be of medium or heavy duty performance class, as required, shall facilitate communication with a visitor without allowing entry and shall allow the passage of parcels of maximum size 250 mm x 250 mm x 25 mm without the door having to be opened.

4.7.6 Louvre doors

A door that has slats usually running horizontally so spaced so as to offer ventilation. Individual louvres shall be straight and evenly spaced, and the timber shall be finely sanded and of clear grade [see Figure 1 (k)].

4.7.7 Patterned doors

Patterns shall be clearly cut or embossed, without damage to the face grain.

4.7.8 Screen doors

Screening shall be well positioned and tightened.

NOTE The screen is usually attached to the outside of the door and, in cases where security is a requirement, expanded metal is normally used.

4.7.9 Special doors

Special doors shall be such as to be acceptable by both manufacturer and purchaser.

4.8 Special features

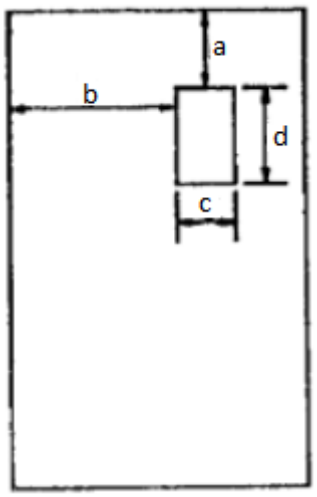
4.8.1 General

4.8.1.1 Doors may have one or more of the special features given in 4.8.2 to 4.8.5 (inclusive), as required.

4.8.1.2 Any special features that are not covered in 4.8.2 to 4.8.5 shall be as required and shall be such as to be acceptable by both manufacturer and purchaser.

4.8.2 Cut-outs

When cut-outs for glazing or ventilation are required, the position and sizes of the cut-outs shall be as required and as indicated by the purchaser in accordance with Figure 3. Cut-outs shall be acceptably clean cut.



Key

a) a dimension from top

b) b dimension from hanging stile

c) c width of cut-out

d) d height of cut-out

NOTE It is preferable to specify a standard size and position of cut-out when ordering.

Figure 3 — Positioning of Cut-outs (Typical)

4.8.3 X-ray attenuation door

X-ray attenuating doors shall be fully lined with one or more lead sheets of total thickness not less than 1.0 mm, or as required to block radiation.

NOTE The requirements for attenuation are dependent on the intensity of the radiation. Generally, lead sheets of thickness 1 mm are considered safe as the general public should not be exposed to radiation levels exceeding 0.5 Rem per year.

4.8.4 Ledges on stable doors

Meeting ledges on stable doors shall be rebated to half of the door thickness and shall have an overlap of at least 10 mm. The top leaf shall open towards the outside, unless otherwise required.

4.8.5 Stiles on double-leaf doors

Unless otherwise required, meeting stiles on double doors shall be rebated to at least 50 % of the door thickness and shall have an overlap of at least 12 mm. Double doors shall be of unmatched veneer, unless otherwise required.

4.9 Finish

4.9.1 General

The finish on a door shall be one of the finishes given in 4.9.2 to 4.9.6, as required. When a door in a vertical position and illuminated from above and viewed from a distance of not less than 1 m from its face, it shall show no telegraphing. Doors shall be free from dirt, stains, oily marks and mechanical damage.

NOTE It is recommended that a matt finish be used for painting or varnishing and that veneer not be used when painting is required.

4.9.2 Cladding

Cladding shall be as required by the purchaser.

4.9.3 Veneering

4.9.3.1 General

When surfaces are veneered, veneer grades shall be as required by the purchaser.

4.9.3.2 Veneering for natural finish

When natural finishes such as varnish or stain are to be applied, doors shall be of the required timber species and of the grade and finish required. There shall be no sand-through on either face of the door.

4.9.3.3 Veneering for coating

When coating finishes such as painting are to be applied, four sand-through areas, each of size not exceeding 30 mm in diameter, shall be permitted on each face.

4.9.4 Coating

Coatings shall be such as to be acceptable by both manufacturer and purchaser.

4.9.5 Sanding

Doors shall be fine-sanded unless otherwise required.

4.9.6 Special finish

Specially finished doors shall be finished as required.

4.10 Direction of opening

The direction of opening of a door shall be in accordance with the directions given in Figure 4.

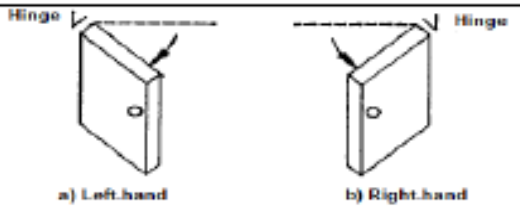
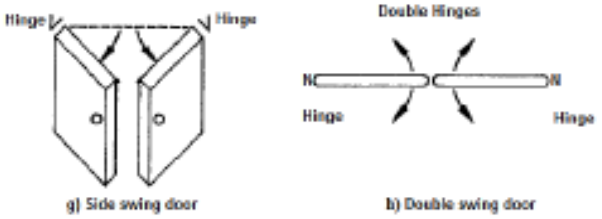
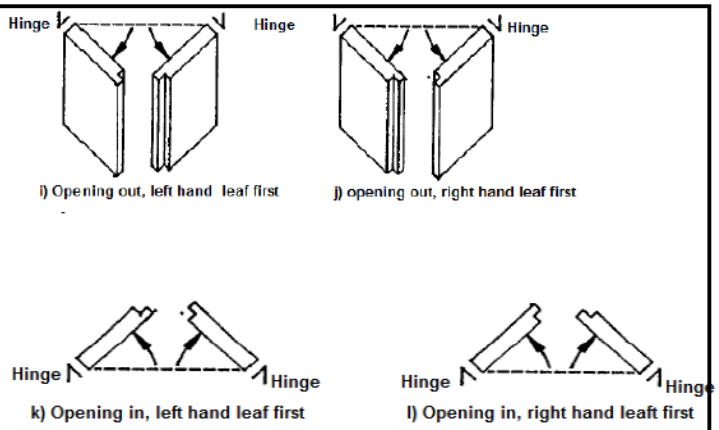
Door type	Opening directions
Balanced doors, single leaf	 a) Left-hand b) Right-hand NOTE when pulling a door open, the edge of the door to which the hinges are fitted is the hand of the door
Unbalanced doors, e.g. batten, panel and stable doors	 c) Left-hand, opening out d) Right-hand, opening out In = to inside of room or building Out = to outside of room or building  e) Left-hand,opening in f) Right-hand,opening in
Balanced double-leaf swing doors with rounded meeting stiles	 g) Side swing door h) Double swing door
Unbalanced double-leaf doors with rebated meeting stiles	 i) Opening out, left hand leaf first j) opening out, right hand leaf first k) Opening in, left hand leaf first l) Opening in, right hand leaft first

Figure 4 — Door opening directions

4.11 Air expansion

Provision shall be made for the expansion of air in the core cavities of doors, where applicable.

5 Inspection and test methods

5.1 Inspection

Visually examine the door for compliance with all the relevant requirements of this specification for which tests to assess compliance are given in 5.2.

5.2 Test methods

Except when carrying out the test to determine resistance of wooden doors to soft body impact, the same door(s) shall be used for all tests in the order given below:

a) moisture content of timber;

b) squareness;

c) resistance of wooden doors to torsion;

d) resistance of wooden doors to hard body impact; and

e) resistance of wooden doors to soft body impact.

5.3 Moisture content of timber ,

Use EAS 272

5.4 Squareness.

Use ISO 6443

For doors with a rounded top ,measure the diagonals from two points of equal distance from the base the door and ending from the start of the rounding

6 Packing

Doors shall be so packed or packaged that they are protected against damage during normal transportation, storage and handling.

7 Marking

The following information shall be given legibly and indelibly marked on the top or edge of each door:

a) manufacturer's name, trade name or trade mark;

b) month and the year of manufacture;

c) lot number;

d) exposure class;

e) performance class; and

f) any additional information that may be required, in an acceptable manner, for example, stock numbers, or positions of coat rails and closing blocks.

Annex A
(Informative)

Notes to purchasers

The following requirements should be specified in tender invitations and in each order or contract:

a) type of the door(see 4.1 and 4.7);

b) exposure class (see 4.2);

c) materials to be used in the construction of a door (see 4.3);

d) finish to the edge of the door [see 4.4.4(b)];

e) size(s) and positions of coat rails and closing blocks (see 4.4.5);

f) dimensions (see 4.5.1);

g) performance class (see 4.6.1);

h) finish (see 4.9);

i) direction of opening (see 4.10);

j) any special features (see 4.8); and

k) any additional marking, when relevant [see 7(f)].

Annex B
(Informative)

Quality evaluation of doors

B.1.1 When a purchaser requires ongoing verification of the quality of doors, it is suggested that, instead of concentrating solely on evaluation of the final product, he also direct his attention to the manufacturer's quality system. In this connection it should be noted that US ISO 9001 covers the provision of an integrated quality system.

B.1.2 If no information about the implementation of quality control or testing during manufacture is available to help in assessing the quality of a lot (as defined in B.2.1), and a purchaser wishes to establish by inspection and testing of samples of the final product whether a lot of the doors complies with the specification, the sampling plan given in B.2.2 and based on the stated AQL's can be applied. (If a different AQL is required, reference should be made to applicable statistical sampling tables).

Annex C
(Informative)

Handling, storage, installation and maintenance of doors

C.1 Handling

C.1.1 Doors should preferably be handled or carried by two people.

C.1.2 Where machines are used for handling stacked doors, a pallet or slip sheet base with a protective sheet of material on top, and strapped edge protectors should be used to keep the bundle intact for purposes of transportation.

C.1.3 Special care should be taken with the handling of glazed casement and sliding doors.

C.1.4 When doors are being tested, they should not be disturbed between tests, as this may influence the results.

C.1.5 Doors should be protected from the elements during transportation and during storage on building sites.

C.2 Storage

C.2.1 Doors should be stored flat in a dry area clear of the ground. Where bundles of doors are stacked one on top of the other, spacers of equal height and positioned vertically above one another should be.

C.2.2 During long periods of storage, it is advisable to cover the tops of the door stacks with a suitable material to prevent "shop soiling".

C.3 Installation

C.3.1 In order to protect doors from the elements, it is preferable to install doors (and timber frames) only once the building is waterproof.

C.3.2 If doors need trimming, equal amounts should be trimmed off opposite edges to avoid exposing core material or joints. All cut edges should be well finished off and coated before the doors are fitted.

C.3.3 All the surfaces on doors of Exposure Classes 1 and 2 should be coated with the appropriate finish before final installation.

C.3.4 When building-in door frames, allowance should be made for the thickness of floor screeds and floor coverings (carpet or tiles), in order to minimize trimming of doors.

C.3.5 Where door frames are to be built in, good planning and controlling of the operation could avoid the necessity of trimming the doors and could cut down on carpentry costs and installation time.

C.3.6 No wooden door will remain stable without an adequate coating.

Bibliography

[1] US 1777: 2017, General wooden door shutters — Specification

