



BSI Standards Publication

**Small craft - Windows, portlights, hatches,
deadlights and doors - Strength and
watertightness requirements**

National foreword

This British Standard is the UK implementation of EN ISO 12216:2018. It is identical to ISO 12216:2002. It supersedes BS EN ISO 12216:2002, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GME/33, Small craft.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Amendments/corrigenda issued since publication

Date	Text affected
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English Version

Small craft - Windows, portlights, hatches, deadlights
and doors - Strength and watertightness requirements
(ISO 12216:2002)

Petits navires - Fenêtres, hublots, panneaux,
tapes et portes - Exigences de résistance
et d'étanchéité (ISO 12216:2002)

Kleine Wasserfahrzeuge - Fenster, Bullaugen, Luken,
Seeschlagblenden und Türen - Anforderungen an die
Festigkeit und Wasserdichtheit (ISO 12216:2002)

This European Standard was approved by CEN on 16 April 2018.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

The text of ISO 12216:2002 has been prepared by Technical Committee ISO/TC 188 “Small craft” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 12216:2018.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

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

This document supersedes EN ISO 12216:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2013/53/EU.

For relationship with EU Directive 2013/53/EU, see informative [Annex ZA](#), which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 12216:2002 has been approved by CEN as EN ISO 12216:2018 without any modification.

Annex ZA

(informative)

Relationship between this European Standard and the Essential Requirements of Directive 2013/53/EU aimed to be covered

This European standard has been prepared under a Commission's standardization request M/542 C(2015) 8736 final to provide one voluntary means of conforming to Essential Requirements of Directive 2013/53/EU.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in [Table ZA.1](#) confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex I and Annex II of Directive 2013/53/EU

Essential Requirements of Directive 2013/53/EU	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Annex I, Part A, 3.4 – Openings in hull, deck and superstructure	4, 5, 6, 7, 8 Annexes A, B, C, D, E, F	This standard specifies the scantling determination of windows, portlights, deadlights, hatches and doors. The structure supporting these elements shall be in accordance with EN ISO 12215. The design categories specified in EN ISO 12217 shall be used where required. This standard does not specify requirements for through-hull fittings designed to allow water passage into and/or out of the hull.
Annex I, Part A, 3.8 – Escape	6.3.7	In respect of multihull escape hatch dimensions, glazing material, opening requirements and hinge disposition only. The characteristics set out in clause 6.3.7 of this standard in respect of multihull escape hatches are applicable for all habitable multihulls considered to be susceptible to inversion according EN ISO 12217-2:2015, clause 7.11, not only those with $L_H > 12\text{m}$.
Annex II, 5 – Components – Prefabricated hatches and portlights	4, 5, 6, 7, 8 Annexes A, B, C, D, E, F	Clause 6.3.8 specifies the information to be supplied with commercially available appliances at the time of purchase.

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 12216 was prepared by Technical Committee ISO/TC 188, *Small craft*.

[Annexes A, B, C, D](#) and [E](#) form integral parts of this International Standard. [Annexes F](#) and [G](#) are for information only.

Small craft - Windows, portlights, hatches, deadlights and doors - Strength and watertightness requirements

1 Scope

This International Standard specifies technical requirements for windows, portlights, hatches, deadlights and doors on small craft of hull length up to 24 m, taking into account the type of craft, its design category, and the location of the appliance.

The appliances considered in this International Standard are only those that are critical for the craft's watertightness, i.e. those that could lead to flooding in case of rupture of the plate.

This International Standard is mostly intended to be used for recreational craft, but it may be used for non-recreational small craft of hull length up to 24 m, excluding lifeboats. However, it is not applicable to commercial or work boats used in severe conditions.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

[ISO 6603-1:2000](#), *Plastics — Determination of multiaxial impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing*

ISO 7823-1:-¹⁾, *Poly(methyl methacrylate) sheets — Types, dimensions and characteristics — Part 1: Cast sheets*

ISO 8666:-²⁾, *Small craft — Principal data*

ISO 9094-1:-³⁾, *Small craft — Fire protection — Part 1: Craft with a hull length of up to and including 15 m*

ISO 9094-2:-⁴⁾, *Small craft — Fire protection — Part 2: Craft with a hull length of over 15 m*

[ISO 11812:2001](#), *Small craft — Watertight cockpits and quick-draining cockpits*

ISO 12217 (all parts):2002, *Small craft — Stability and buoyancy assessment and categorization*

[EN 356:1999](#), *Glass in building — Security glazing — Testing and classification of resistance against manual attack*

[EN 1063:1999](#), *Glass in building — Security glazing — Testing and classification of resistance against bullet attack*

1) To be published. (Revision of [ISO 7823-1:1998](#))

2) To be published.

3) To be published.

4) To be published.

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1 appliance

device made of a plate and possibly a framing system, used to cover an opening in the hull or superstructure of a boat

EXAMPLE Windows, portlights, hatches, deadlights, doors, sliding appliances, escape hatches.

3.2 plate

sheet of material, which may be transparent, that is fixed on the boat structure either directly or via a framing system

3.2.1 stiffened plate

plate equipped with stiffeners

3.2.2 non-stiffened plate

plate directly fixed on its supports

3.2.3 glazing

transparent or translucent plate

3.2.4 unsupported dimensions of a plate

clear dimensions between the supports bearing the plate

SEE:

SEE:

3.3 passage

clear opening through which people or material may pass

Note 1 to entry: This definition can be used in defining passage dimensions and passage area.

3.4 window

portlight glazed appliance

Note 1 to entry: The term “portlight” is generally used for a small window.

3.5 deck hatch

appliance fitted on decks and superstructures

3.6 companionway door

door or closing appliance intended to close a companionway opening

3.7 escape hatch

appliance intended to provide an exit and designated means of escape

3.8

multihull escape hatch

appliance allowing a viable means of escape in the event of inversion

Note 1 to entry: As this hatch is not normally totally immersed in the upright and inverted position, it is usually fitted below deck level on the hull side, nacelle or crossarm bottom, or transom.

3.9

deadlight

shutter secondary watertight closure, fitted to a window, a hatch or a door, and which may be fitted inside or outside the plate

3.10

closing appliance

device used to cover an opening in the cockpit, hull or superstructure

3.11

sliding appliance

appliance that can slide in a rabbet or a frame

3.11.1

framed plate sliding appliance

plate mechanically connected to a frame that slides in a rabbet or a frame

3.11.2

frameless plate sliding appliance

plate without frame that slides in a rabbet or a frame

3.12

design category

description of the sea and wind conditions for which a boat is assessed to be suitable

3.12.1

design category A category for “ocean” sailing

boat designed for extended voyages where conditions experienced may exceed wind force 8 (Beaufort Scale) and significant wave heights of 4 m and above, but excluding abnormal conditions (e.g. hurricanes)

3.12.2

design category B category for “offshore” sailing

boat designed for offshore voyages where conditions up to and including wind force 8 (Beaufort Scale) and significant wave heights up to and including 4 m may be experienced

3.12.3

design category C category for “inshore” sailing

boat designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 (Beaufort Scale) and significant wave heights up to and including 2 m may be experienced

3.12.4

design category D category for sailing in “sheltered waters”

boat designed for voyages in sheltered waters, small bays, estuaries, lakes, rivers and canals, where conditions up to and including wind force 4 (Beaufort Scale) and maximum occasional wave heights up to and including 0,5 m may be experienced

3.13

sailing boat

boat for which the primary means of propulsion is by wind power, having: $A_S \geq 0,07 \times (m_{LDC})^{2/3}$

where

A_S is the projected sail area according to [ISO 8666](#);

m_{LDC} is the loaded mass of the boat, expressed in kilograms.

Note 1 to entry: Motor sailers are regarded as sailing boats.

3.14

motor boat

boat designed to use engine power as its primary means of propulsion

3.15

waterline

side projection of the flotation plan, when the boat is upright and in fully loaded ready-for-use conditions

3.16

length of hull

L_H

length of hull according to [ISO 8666](#)

3.17

appliance location area

area of the boat where the appliance is fitted

Note 1 to entry: See [annex A](#) for sketches showing examples of appliance location areas.

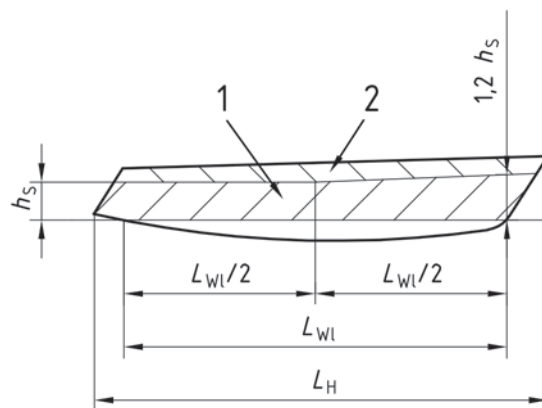
3.17.1

area I

part of the hull sides situated above waterline, i.e. up to its intersection with the weather deck (for decked craft), or the upper edge of the hull (for open craft or partially decked craft), but only to the following upper boundary:

- a horizontal line located at the height h_S above waterline in the rear half of the waterline (see [Figure 1](#));
- a sloped line having a height h_S at mid waterline, and a height $1,2h_S$ at the front end of the waterline, with
 - $h_S = L_H/12$ for sailing monohulls,
 - $h_S = L_H/17$ for motor boats, sailing catamarans and central hull of sailing trimarans.

Note 1 to entry: The outer hulls of sailing trimarans are considered to be entirely in Area I.



Key

- | | |
|---|-----------|
| 1 | Area I |
| 2 | Area II b |

Figure 1 — Limits of Areas I and II b

3.17.2

area II a

area, other than Area I, where persons are liable to walk or step, such as decks, superstructures, cockpit soles, at an inclination of less than 25° to the horizontal in a longitudinal direction, and at an inclination of less than 50° to the horizontal in the transversal direction respectively for sailing monohulls, or 25° for multihulls

3.17.3

area II b

areas from the hull sides not belonging to Area I

Note 1 to entry: The following areas may be included if they correspond to the definition:

- ransoms of all types of craft;
- rear faces of transverse girders of multihulls when located above the waterline.

Note 2 to entry: Areas placed below the waterline are not covered by this International Standard.

Note 3 to entry: Areas on which people may stand or step, even inadvertently, are part of Area II a.

EXAMPLE 1 Top of sailboat coachroof on which one may stand or attend to sails.

Note 4 to entry: Superstructure areas on which people may not normally stand or step, are not part of Area II a, but Area III.

EXAMPLE 2 Top of motorboat wheelhouse out of normal working deck areas.

3.17.4

area III

area, other than Area I or II

EXAMPLE Superstructures, decks or cockpits soles which cannot be considered as belonging to Area II.

Note 1 to entry: On some boat types, Area III may be divided into particular areas. For example superstructure front and superstructure sides on motorboats.

3.17.5

area IV

parts of Area III protected from the direct impact of sea or slamming waves

EXAMPLE Cockpit sides, rear faces of superstructures.

Note 1 to entry: Areas other than the ones given in the example may be included in Area IV. The protection against impact from the sea shall be taken into account by the manufacturer.

3.18

type of plate end connection

Note 1 to entry: See [annex B](#) for sketches showing examples of types of plate end-connection.

3.18.1

semi-fixed

SF plate

plate fixed in a way to restrict deflection and prevent lateral movement at its boundaries

EXAMPLE Unframed or framed plate, if bolted and/or glued.

3.18.2

simply supported

SS plate

plate that can deflect at its boundaries and/or perform lateral movement

EXAMPLE Unframed plate, whether hinged or sliding.

3.18.3

flexibly connected plate

simply supported plate where the connection is achieved by an elastic support around the perimeter of the plate

Note 1 to entry: A car windscreen joint, shown in [Figure B.3](#), is a flexibly connected plate where there is no overlap between the plate and its support, hence the plate may be pushed in the boat by the outside pressure.

3.19

watertightness

capacity of an appliance or a fitting to prevent ingress of water inside the boat

3.20

degree of watertightness

capacity of an appliance or fitting to resist ingress of water according to the conditions of exposure to water

3.20.1

degree of watertightness 1

protection against effects of continuous immersion in water

3.20.2

degree of watertightness 2

protection against effects of temporary immersion in water

3.20.3

degree of watertightness 3

protection against splashing water

3.20.4

degree of watertightness 4

protection against water drops falling at an angle of up to 15° from the vertical

3.21

glass material

3.21.1

annealed glass

sheet glass

glass as delivered directly from the fabrication cycle without subsequent treatment

3.21.2

tempered glass

toughened safety glass

glass where better mechanical properties are obtained by thermal treatment

3.21.3

chemically reinforced glass

glass where better mechanical properties are obtained by chemical treatment

3.21.4

monolithic glass

glass consisting of one ply of glass

3.21.5

laminated glass

multi-layer sheet having glass as outer plies, where the inside plies are made of plastic inter-layers, plastic sheets, glass, or other glazing material

4 General requirements

4.1 General

Other International Standards, e.g. dealing with stability and buoyancy, may have restrictions on the position of appliances which are outside the scope of this International Standard and which are therefore not treated here. It is however necessary for the builder or user to ensure that the appliances comply with other relevant International Standards.

4.2 Strength

The strength of plates, framing, tracks and fastening shall meet the requirements of this International Standard.

4.3 Positive closure

Opening appliances shall be positively fixed, when closed, to avoid any inadvertent opening.

EXAMPLES Bolts, latches.

4.4 Watertightness

To avoid flooding, all appliances shall be designed and fixed to prevent substantial ingress of water when closed.

4.4.1 Minimum degree of watertightness

The required minimum degree of watertightness of an appliance is a function of the boat's design category. These requirements are given in [Table 1](#).

The required degree of watertightness of prefabricated appliances shall be tested by the appliance manufacturer before installation on the craft, according to [Table 1](#), using the test method defined in [D.1.1](#).

The required degree of watertightness of any appliance, after installation on the craft, shall meet the requirements of [Table 1](#).

If tests are made, the method described in [D.1.2](#) should be used. Tests are however not normally required.

Table 1 — Minimum degree of watertightness

Type of boat	Appliance location area	Type of appliance	Design category			
			A	B	C	D
Any	Area I	Any	2	2	2	2
Any	Area II	Any	2	2	3	4
Any	Area II	Sliding companionway hatch	3	3	3	4
Any	Area III	Any	3	3	3	4
Sailing monohull	Area IV	Any	3	3	3	4
Motor + Multihull	Area IV	Any	3	3	4	4

The above degrees of watertightness are only required for appliances. The degree of watertightness of any device which is not built into the appliance, for example a ventilation system, but fitted by the boat manufacturer after the purchase of prefabricated appliances, is outside the scope of this International Standard, but shall meet the requirements of any other relevant International Standard. Regarding watertightness of cockpits, the requirements of [ISO 11812](#) shall be met.

4.4.2 Additional requirements related to watertightness

4.4.2.1 Sliding appliances

Sliding appliances shall not be used in Area I.

4.4.2.2 Deck hatches of trimaran outrigger hulls

Hatches fitted on the decks of trimaran outrigger hulls shall not be sliding appliances.

5 Plate materials

5.1 General

Appliance plates shall be made of

- a transparent glazing material, such as poly(methyl)methacrylate (PMMA), polycarbonate (PC), tempered glass ([3.21.2](#)), chemically reinforced glass ([3.21.3](#)) or laminated glass ([3.21.5](#)), or
- a non-transparent plate material, such as plywood (PW), glass-fibre reinforced thermosetting plastic (GRP), aluminium alloy, steel, etc.; or
- any other material of strength and stiffness equivalent to those cited above.

5.2 Acrylic sheet materials

Poly(methyl)methacrylate (PMMA) made with a technique other than the casting procedure shall have mechanical properties and resistance to ageing at least equal to those of cast PMMA.

5.3 Glass

5.3.1 Restrictions of usage

The use of glass is restricted to [clauses 5.3.1.1](#) and [5.3.1.2](#) plus [6.1.1.1](#) for use of simply supported plates, [6.3.1.4](#) for use in Area I and [6.3.2](#) for use in Area II.

5.3.1.1 Monolithic glass

Monolithic glass ([3.21.4](#)) shall only be made of tempered glass ([3.21.2](#)), or chemically reinforced glass ([3.21.3](#)).

5.3.1.2 Laminated glass

The glass plies used in laminated glass ([3.21.5](#)) can be made of any type of glass.

6 Specific requirements

6.1 End connection and location of plate

6.1.1 Simply supported plates

6.1.1.1 Plates in Area I

Simply supported plates shall not be used in Area I:

- on sailing monohulls in design categories A and B and sailing multihulls in design category A.

- on motor boats in design category A.

On other types of craft and design categories, simply supported plates may be used provided that all the following conditions are met:

- the glazing material is PMMA or PC (see [clause 5](#));
- the plate thickness is equal to 1,3 times the one required by [clause 7](#);
- the fixing devices of the plate (hinge bolts, fixing knob, etc.) are not spaced more than 250 mm.

The above restrictions of use need not be considered if the appliance is equipped with a deadlight meeting the requirements of [6.3.6](#).

6.1.1.2 Flexibly connected plates

Flexibly connected plates may only be used on motor boats of design categories C and D in Areas III and IV.

6.1.2 Semi-fixed plates

6.1.2.1 Plates made of material other than glass

Semi-fixed plates may be used in boats of all design categories and in all location areas with the restrictions of the special requirements given in [6.3](#).

This type of end connection can be achieved by one of the following means.

- Connected with a counter frame: The edge fixity is achieved by pinching the plate at its periphery between the boat shell or a frame and a counter frame. The counter frame shall be mechanically fastened and/or glued to the structure of the boat.
- Connected by gluing: The edge fixity is achieved by gluing the plate at its periphery to the boat shell, to the structure of the boat or to a frame. This gluing can either be in a rabbet or a face, edge gluing or any combination of these gluing methods.
- Connected by direct fastening: The edge fixity is achieved by fastening the plate inside its periphery to the shell, the structure of the boat or to a frame by correctly spaced and sized mechanical fasteners. These fasteners may be bolts, rivets, self-tapping screws or any adequate mechanical fasteners.

NOTE Even with the best fastening system, full edge fixity of a non-stiffened plate at its periphery can never be achieved. Plates are therefore considered at best as semi-fixed.

6.1.2.2 Plates made of glass

Metal to glass contact shall be avoided.

6.2 Fastening requirements

6.2.1 Fastening of plates and frames

Plates and frames can be fastened by mechanical means, glue or elastomer joints. All types of fastening shall ensure watertightness of the plate or frame, and resistance to loads due to normal operating pressure.

Every part of the mechanical elements connecting appliances to the rest of the craft shall be capable of withstanding, without breaking, twice the force induced by the pressure loads defined in [clause 7](#). This requirement shall be verified for inwards opening appliances, where hinges, locks, or any other part of the link chain between the plate and the support shall be checked by calculation or testing in accordance with [D.2](#).

6.2.2 Fastening of semi-fixed plates

Mechanical fasteners shall not induce parasitic stresses due to deflection or temperature changes, nor stress concentration or stress raising.

EXAMPLE Bolts in sharp angle counterbores and countersunk screw heads in conical bores shall not be used.

Additional stresses brought by cold forming shall be considered when determining the plate scantlings in [clause 7](#) or [8](#).

6.2.3 Fastening of glued plates

Glued joints shall be resistant to (or protected against) sunlight (UV, heat, etc.) and all environmental effects or cleaning chemicals normally encountered in the manufacture and use of the craft.

Glued joints shall fulfil the requirements of one of the following items:

- a) the inside pressure test ([D.3.2](#));
- b) the separation test ([D.3.3](#));
- c) the manufacturer's gluing procedure and conditions are followed and the bond strength checked by calculation to meet test pressure in [D.3.2.2](#).

The above requirements shall be verified after any change in material or gluing procedure.

Plates, with or without framing, are considered glued if they are fastened with mechanical devices, such as bolts, rivets or screws, spaced more than 20 times t , where t is the nominal plate thickness defined in [7.2](#).

6.3 Special requirements

6.3.1 Appliances fitted in Area I

6.3.1.1 Height above waterline and maximum short side dimension

The lower edge of any opening appliance shall be placed at least 200 mm above the waterline, the boat being in the fully loaded ready-for-use condition and upright. These opening appliances shall in any case be located according to the relevant requirements of ISO 12217.

The small unsupported dimension b (or the equivalent of b) of any appliance (see [annex C](#)) placed in Area I shall not exceed 300 mm.

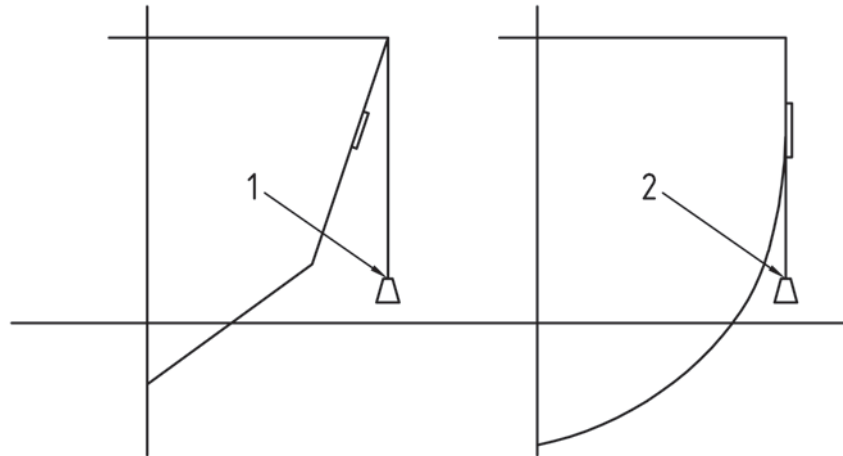
The above requirements do not apply to escape hatches of sailing multihulls, or designated escape hatches, when required by ISO 9094.

6.3.1.2 Opening side

All opening appliances shall open inwards, with the exception of multihull escape hatches or designated escape hatches, when required by ISO 9094.

6.3.1.3 Protection

On boats of design categories A and B, no part of the plate or its framing shall extend outside the local vertical tangent to the hull, deck, rubbing strake, fixed fender, or of a built-in fairing which is an integral part of the hull. [Figure 2](#) explains this requirement.



Key

- 1 The local vertical tangent is outside the porthole: no problem
- 2 The local vertical tangent is inside the porthole: the porthole shall either be placed in a recess or protected by a built-in fairing

Figure 2 — Sketch explaining the requirement of [6.3.1.3](#)

6.3.1.4 Use of glass

Glass shall not be used on sailing boats of all design categories and on motor boats of design categories A and B, unless the plate is made of high-impact-resistance glass, or if the appliance is equipped with a deadlight meeting the requirements of [6.3.6](#). High-impact-resistant glass types are listed in normative [annex E](#).

6.3.2 Appliances fitted in Area II a

6.3.2.1 Use of glass

On motor boats, the usage of monolithic and laminated glass is accepted without restriction.

On sailing boats, neither monolithic nor laminated glass shall be used forward of the mast or foremast, unless the plate is made of high-impact-resistance glass, or if the appliance is equipped with a deadlight meeting the requirements of [6.3.6](#). High-impact-resistant glass types are listed in [annex E](#).

This restriction need not be considered if the plate is protected against shocks by an adequate device.

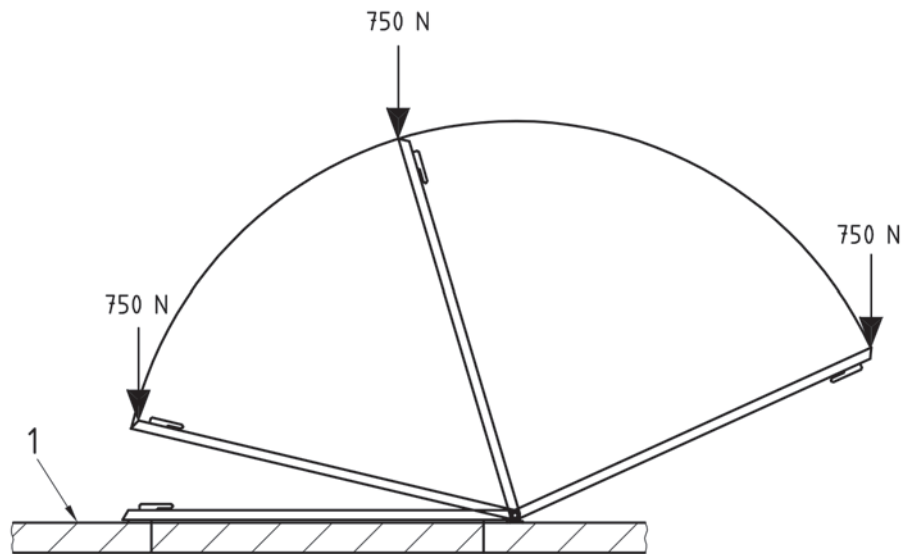
EXAMPLE Outside grid network, protection bars.

6.3.2.2 Tests on hinged deck hatches

6.3.2.2.1 Unintentional stepping test

The test is performed on a hinged deck hatch fixed to a rigid flat support of dimensions twice those of the hatch, as shown in [Figure 3](#).

The hatch is open in any position, up to its maximum operating position, and shall be able to withstand a concentrated force of 750 N applied anywhere on the outside edge of the hatch, without permanent deformation or damage to the hatch, its framing or hinge. The hatch will normally close under the applied force, and the system that is used to maintain the hatch open may be damaged. The hatch is considered to fulfil the requirements of this test if the integrity of the hatch, and its closing and watertightness capabilities, are maintained.



Key

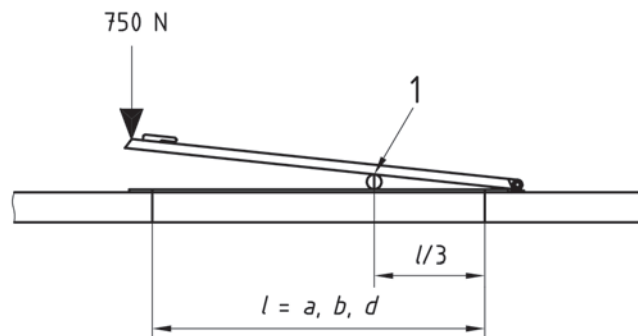
1 Flat plate (see 6.3.2.2.1)

Figure 3 — Unintentional stepping test

6.3.2.2.2 Rope jamming test

The test is performed on the same test device and loading as in 6.3.2.2.1, but with a 14 mm, three-strand polypropylene rope simultaneously jamming both sides, as shown in Figure 4.

The test is considered as passed if there is no permanent deformation or damage to the plate, its framing or hinges.



Key

1 Three-strands polypropylene rope of diameter 14 mm

Figure 4 — Rope jamming test

6.3.2.2.3 Hatch and hinge strength test

The test is performed on the same test device as in 6.3.2.2.1, with the hatch open at 90°, as shown in Figure 5.

Apply a twisting torque made by two parallel and opposite forces of 200 N, acting on the two outside corners (or horizontal diameter) of the opening part of the hatch.

The test is considered as passed if there is no permanent deformation or damage to the plate, its framing or hinges.

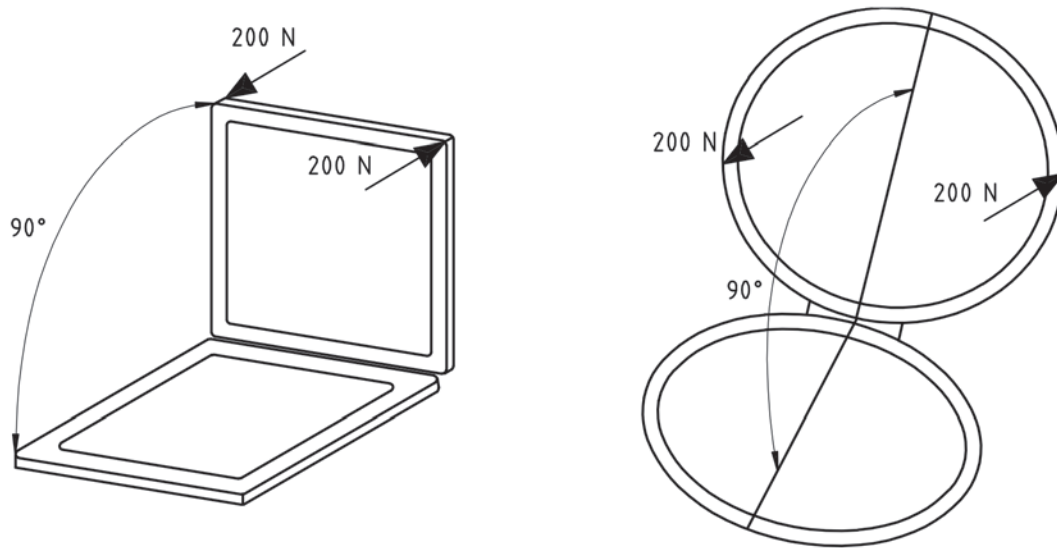


Figure 5 — Hatch and hinge strength test

6.3.3 Sliding appliances

6.3.3.1 Rabbet depth

The depth of the rabbet shall be sufficient to prevent any disengagement of the plate under the pressure loads defined in [clause 7](#), taking into account the size of the appliance, the material of which it is made, and the rigidity of the structure it is fixed on. For unframed plates made of PMMA, PC, or materials with similar Modulus of elasticity, this depth shall be at least 12 mm.

6.3.3.2 Stops

The appliance shall be fitted with stops at each end of its stroke to prevent any disengagement of the sliding part of the frame.

6.3.4 Doors made with removable sections: washboards

Doors made with removable sections, usually called “washboards”, shall be

- a) fitted with a device to keep them in position, when in use, and to be at least operable from inside, and
- b) stored inside the craft in the vicinity of the door opening, and easily reached without the use of tools.

Craft of design category A shall be equipped with a device connecting the boards together when not in use.

EXAMPLE Lanyards.

6.3.5 Locking system

Any appliance shall have a locking device which maintains it in a closed position, operable at least from inside.

On doors, this system shall be operable from both sides.