
Mala plovila - Okna, lopute, pokrovi in vrata - Zahteve za trdnost in odpornost proti vodi (ISO/DIS 12216:2026)

Small craft - Windows, portlights, hatches, deadlights and doors - Strength and watertightness requirements (ISO/DIS 12216:2026)

Kleine Wasserfahrzeuge - Fenster, Bullaugen, Luken, Seeschlagblenden und Türen - Anforderungen an die Festigkeit und Wasserdichtheit (ISO/DIS 12216:2026)

Petits navires - Fenêtres, hublots, panneaux, tapes et portes - Exigences de résistance et d'étanchéité (ISO/DIS 12216:2026)

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ICS:

47.080	Čolni	Small craft
91.060.50	Vrata in okna	Doors and windows

oSIST prEN ISO 12216:2026

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DRAFT International Standard

ISO/DIS 12216

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

*Petits navires — Fenêtres, hublots, panneaux, tapes et portes —
Exigences de résistance et d'étanchéité*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (EN ISO 12216:2022/A11:2023^[1]), which has been technically revised.

The main changes compared to the previous edition are as follows:

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

1 Scope

This document specifies technical requirements and test methods for windows, portlights, hatches, deadlights and doors on small craft. It takes into account the type of craft, its design category, and the location of the appliance.

The appliances considered in this document are only those that are critical for the craft's watertightness.

Openings and non-opening devices fitted below area I (see 3.5.2) are excluded from the scope of this document.

2 Normative references

The following documents are 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 6603-1, *Plastics — Determination of puncture impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing*

ISO 9094, *Small craft — Fire protection*

ISO 9094:2022, *Small craft — Fire protection*

ISO 12215-5, *Small craft — Hull construction and scantlings — Part 5: Design pressures for monohulls, design stresses, scantlings determination*

ISO 12215-5:2019, *Small craft — Hull construction and scantlings — Part 5: Design pressures for monohulls, design stresses, scantlings determination*

ISO 12215-7, *Small craft — Hull construction and scantlings — Part 7: Determination of loads for multihulls and of their local scantlings using ISO 12215-5*

ISO 12217-2, *Small craft — Stability and buoyancy assessment and categorization — Part 2: Sailing boats of hull length greater than or equal to 6 m*

ISO 15510, *Stainless steels — Chemical composition*

EN 485-2, *Aluminium and aluminium alloys - Sheet, strip and plate - Part 2: Mechanical properties*

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 <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

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3.1 General definitions of openings and their coverings**3.1.1****hull**

envelope of the craft located below sheerline, as defined in ISO 8666^[2]

3.1.2**deck**

envelope of the craft located above sheerline as defined in ISO 8666^[2]

3.1.3**superstructure**

decked structure on the deck

3.1.4**transom**

aft limit of the hull

3.1.5**craft envelope**

hull, deck or superstructure in which an opening might admit water into the interior

3.1.6**heeled waterline**

level of the water on the hull in the fully loaded ready-for-use m_{LDC} condition when the craft is inclined to

- 7° for motor boats and sailing multihulls; or
- 30° or immersion of the sheerline, whichever occurs first, for monohull sailing boats

Note 1 to entry: The fully loaded ready-for use condition is defined in ISO 8666^[2].

3.1.7**opening**

cut-out in the envelope of a craft such as in the hull or superstructures

Note 1 to entry: An opening is usually covered by a glazing or an appliance, that can be fixed or opening.

3.1.8**clear opening dimensions**

dimensions of the area within a structure or frame, through which objects or people may pass when the incorporated plate is disregarded

3.2 Devices covering an opening**3.2.1****appliance**

device made of a *plate* (3.3.1) plate and its associated frame(s), opening (hingeing) and fixture systems, when included, used to cover an opening in the hull, deck or superstructure of a boat; it can be fixed or openable (detachable, hinged, sliding, folding, etc.)

EXAMPLE window (3.4.1), portlight (3.4.2), hatch (3.4.3), deadlight (3.4.7), door (3.4.6), sliding appliance (3.2.5), escape hatches.

3.2.2**fixed appliance**

non opening appliance (3.2.1)

3.2.3**opening appliance**

appliance (3.2.1) that can be opened

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3.2.4

hinged appliance

opening appliance (3.2.3) that is connected to its framing by hinges

3.2.5

sliding appliance

opening appliance (3.2.3) which opens by sliding in line with its area, in any plane, where the plate either slides in a rabbet or a frame or is fixed in a sliding frame

3.2.6

appliance system

appliance comprising of a secondary appliances (e.g. portlights) situated within plates of a primary appliance that are themselves attached to the vessel to cover an opening in the vessel envelope

3.3 Plate of an appliance

3.3.1

plate

sheet of material, transparent or not, that is attached to the craft structure either directly or indirectly, may be fixed or opening

3.3.2

stiffened plate

plate (3.3.1) with associated structural stiffeners

3.3.3

non-stiffened plate

plate (3.3.1) not equipped with associated structural stiffeners

3.3.4

frame

a rigid structure surrounding an empty space or nonstructural panels, may be a structural stiffener of a *plate* (3.3.1), it may be attached to a *plate* (3.3.1)

EXAMPLE a *mullion* (3.9.14) is a stiffening frame

3.3.5

unsupported dimensions of a plate

clear dimensions between the inner edges of supports bearing the *plate* (3.3.1)

Note 1 to entry: These dimensions can be different from the *opening* (3.1.7) dimensions in the craft envelope, because a *plate* (3.3.1) can be fixed in either a fixed or opening framing.

Note 2 to entry: See [Annex B](#) and [Annex C](#).

3.3.6

glazing

plate (3.3.1) that is transparent or translucent

Note 1 to entry: Consider changing glazing definition given impact resistance, brittleness and safety (fragmentation pattern), PMMA vs Glass.

3.3.7

sandwich plate

plate (3.3.1) having an inner core covered on each side by a working skin

3.4 Specific appliances

3.4.1

window

glazed appliance (3.2.1)

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3.4.2

portlight

framed *window* (3.4.1), fixed or opening, located in the hull or transom below deck which, where openable, is hinged and opens inwards

3.4.3

hatch

opening appliance (3.2.3), glazed or not glazed, used for access, lighting, inspection, ventilation or reach, located on any part of the craft envelope

3.4.4

fire escape hatch**escape hatch**

hatch (3.4.3) intended or dedicated to provide an exit for people and designated means of escape

Note 1 to entry: See ISO 9094^[3] for definitions and requirements.

3.4.5

multihull escape hatch

appliance (3.2.1) allowing a viable means of escape in the event of inversion for multihulls vulnerable to inversion

Note 1 to entry: See ISO 12217-2^[4]

Note 2 to entry: As this appliance is not immersed in the upright and inverted position, it is usually fitted below deck level on the hull side, nacelle or crossarm bottom, or transom.

3.4.6

door

opening appliance (3.2.3) up to 45° from the vertical intended to close a companionway *opening* (3.1.7)

EXAMPLE Door open at sea, door not open at sea, hinged door, sliding door.

3.4.7

deadlight

secondary watertight *appliance* (3.2.1), permanently attached or separate and fitted to the inside of a *window* (3.4.1)

3.4.8

washboard

opening appliance (3.2.3) for companionway *opening* (3.1.7) made of one or more mobile board(s) that, when closed, are stacked one on top of each other

Note 1 to entry: This device is frequently found on sailing monohulls.

Note 2 to entry: Boards are added as the weather worsens to constitute a higher sill.

3.5 Area definitions

3.5.1

appliance location area

area of the watertight envelope of the craft where the *appliance* (3.2.1) is fitted, if an appliance is fitted across two areas, the most onerous area is used

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

3.5.2

area I

lower hull sides and transom

part of the hull sides (and transom) situated above *reference waterline* (3.9.5), i.e. up the sheerline 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:

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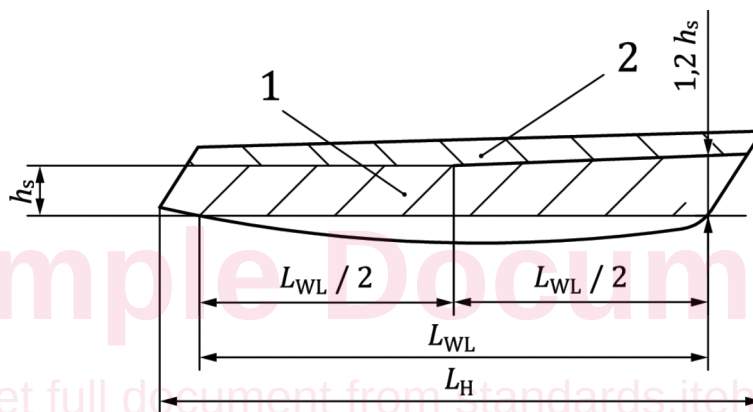
- a horizontal line located at the height h_S above waterline in the rear half of the waterline (see [Figure 1](#));
- a sloped line having a height h_S at mid waterline, and a height $1,2h_S$ at the front end of the waterline, with
 - $h_S = L_H/12$ for sailing monohulls,
 - $h_S = L_H/17$ for motor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

where h_S is limited as per [Table 1](#)

Table 1 — h_S limits of area I

Design category	h_S higher limit	h_S lower limit
A	No limit	0,5 m
B	No limit	0,4 m
C	0,75 m	0,3 m
D	0,40 m	0,2 m

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

3.5.3

area IIa

Accessible part of deck and superstructure

All areas where persons can stand, walk or step, even inadvertently, 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. Superstructure areas on which people cannot normally stand or step, are not part of area II a, but *area III* ([3.5.5](#))

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

3.5.4

area II b

upper hull side and transom

areas from the hull sides (and transom) not belonging to *area I* ([3.5.2](#))

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

- rear faces of transverse girders of multihulls when located above the waterline

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3.5.5

area III

deck and superstructures exposed areas

areas, other than *area I* (3.5.2), *area IIa* (3.5.3) or *area II b* (3.5.4), exposed to the direct impact of sea or slamming waves coming from front and side

EXAMPLE Top of motorcraft wheelhouse is an area on which people cannot normally or inadvertently stand or step.

3.5.6

area IV

deck and superstructure protected areas

parts of *area III* (3.5.5) protected from the direct impact of sea or slamming waves coming from front and side, and not located within $L_H/3$ from the bow

EXAMPLE Cockpits, rear and side faces of superstructures.

Note 1 to entry: Areas other than the ones given in the example can be included in area IV. The protection against impact from the sea is the responsibility of the manufacturer.

3.6 Plate end-connections

See [Annex B](#) for sketches showing examples of types of plate end-connection.

3.6.1

semi-fixed plate

SF plate

plate (3.3.1) fixed to restrict deflection and to prevent lateral movement at its boundaries

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

3.6.2

simply supported plate

SS plate

plate (3.3.1) that can deflect at its boundaries and/or perform a lateral movement

EXAMPLE Unframed plate, whether hinged or sliding, e.g. frameless sliding windows and *hatch* (3.4.3), including companionway sliding hatches, companionway ladderboards, frameless hinged windows.

3.6.3

flexibly connected plate

simply supported plate (3.6.2) 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 can be pushed in the craft by the outside pressure.

3.7 Types of glass

3.7.1

annealed glass

sheet glass

glass as delivered directly from the fabrication cycle without subsequent treatment

3.7.2

thermally tempered glass

TG glass

glass where better mechanical properties are obtained by thermal treatment

3.7.3

chemically reinforced glass

glass where better mechanical properties are obtained by chemical treatment

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3.7.4**monolithic glass**

glass consisting of one ply

3.7.5**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* (3.3.6) material.

3.8 Watertightness**3.8.1****watertightness**

capacity of an *appliance* (3.2.1) or a fitting to prevent ingress of water inside the craft

3.8.2**degree of watertightness**

capacity of an *appliance* (3.2.1) or fitting to resist ingress of water, according to the conditions of exposure to water

Note 1 to entry: See [Table 2](#).

Table 2 — Definitions of the degrees of watertightness

Degree of watertightness	Definition
1 (waterproof)	Constructed to withstand continuous immersion
2 (watertight)	Constructed to prevent ingress of water when tested according to Clause D.2
3 (weathertight)	Constructed to minimize seepage when tested according to D.2.2.1
4 (spraytight)	Protection against water drops falling at an angle of up to 15° from the vertical according to D.2.2.2

3.9 Other general definitions**3.9.1****craft****small craft**

recreational boat, and other watercraft using similar equipment, of up to 24 m length of hull (L_H)

Note 1 to entry: The length of hull is defined in ISO 8666[2].

3.9.2**design category**

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

Note 1 to entry: See ISO 12217-1[5], ISO 12217-2[4] and ISO 12217-3[6].

3.9.3**sailing boat**

craft (3.9.1) for which the primary means of propulsion is by wind power

Note 1 to entry: See also ISO 8666[2].

3.9.4**motor boat**

non-sailing *craft* (3.9.1) upon which the main propulsion system is a propulsion engine