
Small craft — Watertight or quick- draining recesses and cockpits

*Petits navires — Cavités et cockpits étanches ou rapidement
autovideurs*

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 WTO principles in the Technical Barriers to Trade (TBT), see [Foreword - Supplementary information](#).

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

This second edition cancels and replaces the first edition (ISO 11812:2001), which has been technically revised.

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

- systematic usage of the general term "recess" instead of "cockpit";
- introduction of the concept of recess open to the sea and recess with reduced risk of flooding;
- clarification of requirements;
- clarification of requirements on engine ventilation openings installed in recesses;
- implementation of multi-bottom recesses or recesses with a foot-basin in the main core of the standard;
- deletion of "major head losses" (friction in drain pipes) as their effect was very small, but this made the calculation much more complex;
- improved data for "minor head losses" (local losses) to correspond to common practice;

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.

Small craft — Watertight or quick-draining recesses and cockpits

1 Scope

This document specifies watertightness, draining time and sill heights requirements for watertight and quick-draining recesses and cockpits in small craft of up to 24 m load line length (see Reference [1]).

Recesses located in elevated parts of the craft are covered by this document.

This document does not specify requirements for the size, the shape and the location of recesses or cockpits. It only considers draining by gravity, and not by pumping or other methods.

It only considers normal operation of the craft, but unattended craft recess issues are out of scope.

This document does not guarantee that the water contained in a watertight or quick-draining recess or cockpit will not affect the stability and buoyancy of the craft, which are covered by ISO 12217 (all parts):2015.

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 8666:2016¹⁾, *Small craft — Principal data*

ISO 9093-1:1994¹⁾, *Small craft — Seacocks and through-hull fittings — Part 1: Metallic*

ISO 9093-2:2002¹⁾, *Small craft — Seacocks and through-hull fittings — Part 2: Non-metallic*

ISO 12216:2020, *Small craft — Windows, portlights, hatches, deadlights and doors — Strength and watertightness requirements*

ISO 12217-1:2015, *Small craft — Stability and buoyancy assessment and categorization — Part 1: Non-sailing boats of hull length greater than or equal to 6 m*

ISO 12217-2:2015, *Small craft — Stability and buoyancy assessment and categorization — Part 2: Sailing boats of hull length greater than or equal to 6 m*

ISO 12217-3:2015, *Small craft — Stability and buoyancy assessment and categorization — Part 3: Boats of hull length less than 6 m*

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/>

1) Under revision.

**3.1
design category**

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

Note 1 to entry: The design categories are defined in ISO 12217 (all parts):2015.

Note 2 to entry: The definitions of design categories are in line with the European Recreational Craft Directive 2013/53/EU.

**3.2
sailing craft**

craft for which the primary means of propulsion is by wind power, having a reference sail area $A_S \geq 0,07(m_{LDC})^{2/3}$, expressed in metres squared, where m_{LDC} is the mass of the craft in the maximum load condition, expressed in kilograms

Note 1 to entry: The reference sail area, A_S , is defined in ISO 8666:2016.

**3.3
non-sailing craft**

craft for which the primary means of propulsion is other than by wind power, having a reference sail area $A_S < 0,07(m_{LDC})^{2/3}$, expressed in metres squared, where m_{LDC} is the mass of the craft in the maximum load condition, expressed in kilograms

Note 1 to entry: The reference sail area, A_S , is defined in ISO 8666:2016.

**3.4
reference waterline**

W_L
level of the water on the hull in the fully loaded, ready-for-use condition

Note 1 to entry: The fully loaded, ready-for-use condition is defined in ISO 8666:2016.

**3.5
heeled waterline**

level of the water on the hull in the fully loaded, ready-for-use condition when the craft is inclined to:

- an angle of 7° for non-sailing craft and multihulls; or
- the level of the sheer line amidships or an angle of 30°, whichever is lower, for monohull sailing craft

Note 1 to entry: The fully loaded, ready-for-use condition is defined in ISO 8666:2016.

**3.6
recess**

volume open to the air that can retain water within the range of loading conditions and corresponding trims

EXAMPLE Cockpits, wells, open volumes or areas bounded by bulwarks or coamings.

Note 1 to entry: Where fitted with closure device(s) according to ISO 12216:2020, cabins, shelters or lockers are not recesses.

Note 2 to entry: A recess can be composed of several recesses connected together.

Note 3 to entry: Cockpits that are open to the sea are considered as recesses. Flush decks without bulwarks or coamings are not recesses.

**3.7
cockpit**

recess (3.6) intended for the accommodation of people

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3.8**watertight recess**

recess (3.6) that satisfies the watertightness and *sill* (3.24) height requirements of this document, but not the drainage requirements

3.9**quick-draining recess**

recess (3.6) with characteristics and draining capacity that satisfy all the requirements of this document for one or several design categories

Note 1 to entry: According to its characteristics, a recess can be considered as quick-draining for one design category, but not for a higher category.

Note 2 to entry: The term "quick-draining" has been chosen to differentiate from the common understanding term "self-draining", where water can be drained overboard in certain conditions, but without a specified draining speed, height of bottom or sill, etc.

3.10**recess open to the sea**

recess (3.6) where the aft and/or side boundaries are open to the outside of the craft, with a *recess retention height* (3.21) equal to zero

Note 1 to entry: [Figure C.1 c\)](#) gives an example of a recess open to the sea.

3.11**recess bottom**

lowest surface of the *recess* (3.6), where water collects before being drained

Note 1 to entry: The recess bottom can have several levels.

3.12**recess bottom height**

H_B

height of the *recess bottom* (3.11) above the waterline, the craft being upright, at rest and fully loaded

3.13**minimum recess bottom height**

$H_{B \min}$

minimum value of the *recess bottom height* (3.12) required by this document

3.14**single-bottom recess**

recess (3.6) where the bottom has only one level

Note 1 to entry: A single-bottom recess fitted with a *foot basin* (3.31) is considered as a *multi-bottom recess* (3.15).

3.15**multi-bottom recess**

recess (3.6) where the bottom has more than one level

3.16**bridge deck**

area in the proximity of the *companionway* (3.23) opening and above the *recess bottom* (3.11), on which people normally step before entering the accommodation

3.17**interior**

inside the craft's watertight envelope

3.18
watertightness degree
degree of watertightness

capacity of an *appliance* (3.20) or fitting to resist ingress of water, according to the conditions of exposure to water

Note 1 to entry: See [Table 1](#) for a definition of the four watertightness degrees.

Table 1 — Definitions of the degrees of watertightness

Degree of watertightness:	Definition
1 (waterproof)	Constructed to withstand continuous immersion Provides protection against the effects of continuous immersion in water
2 (watertight)	Constructed to prevent ingress of water Provides protection against the effects of temporary immersion in water
3 (weathertight)	Constructed to minimize seepage Provides protection against splashing water
4 (spraytight)	Provides protection against waterdrops falling at an angle of up to 15° from the vertical

NOTE Test procedures for watertightness degrees are provided in ISO 12216:2020.

3.19
downflooding opening

opening in the hull or deck (including the edge of a recess) that might admit water into the interior or bilge of a craft, or into a recess

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Note 1 to entry: Those excluded by ISO 12217 (all parts):2015 are not considered in this document.

3.20
appliance

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device used to cover an opening in the hull, deck or superstructure of a craft

EXAMPLE Windows, portlights, hatches, deadlights, doors, sliding appliances, escape hatches, washboard, compass, ventilation grids, loudspeakers, engine control panel, etc.

Note 1 to entry: They can be fixed appliances or opening appliances.

3.21
recess retention height

h_c
 height of water in a *recess* (3.6), when the craft is upright and at design trim assuming that all gates, doors or drainage openings are sealed, at which the overflow area is greater than $0,005 L_H B_H$ (m²)

Note 1 to entry: The design trim is in maximum load condition as defined in ISO 8666:2016.

Note 2 to entry: When h_c is less than 0,10 m, it is taken as equal to 0,0 m.

3.22
drain

outlet of the *recess* (3.6) enabling water contained to be discharged overboard by gravity

EXAMPLE A pipe discharging overboard above or below waterline; a part of the recess allowing direct discharge overboard; scuppers and freeing port.

3.23
companionway

opening intended for crew access to the accommodation and fitted with an opening *appliance* (3.20)

Note 1 to entry: The opening appliance can be a door, a hatch; vertical, horizontal, etc.

Note 2 to entry: There can be several companionways.

3.24

sill

barrier above which water in the *recess* (3.6) can enter *companionway* (3.23) openings and downflood the craft

EXAMPLE Hatches of cockpit companionways.

3.25

fixed sill

sill (3.24) that is a fixed, integral and permanent part of the *recess* (3.6)

3.26

semi-fixed sill

opening *appliance* (3.20), movable but permanently installed on the craft that, when in place, constitutes a *sill* (3.24) higher than the fixed part of the sill

EXAMPLE Hatches, sliding sills, but excluding washboards.

Note 1 to entry: A lanyard is not regarded as a permanent attachment.

Note 2 to entry: Sliding or hinged doors are considered as a mobile part of a semi-fixed sill.

3.27

washboard

opening *appliance* (3.20) for *companionway* (3.23) openings made of several mobile boards sliding in a rabbet that, when closed, are stacked one on top of each other, and located above the *minimum sill height* (3.29)

Note 1 to entry: This is a frequent device on sailing monohulls; boards are added as the weather worsens.

3.28

sill height

h_s

minimum vertical distance from the top of the *sill* (3.24) to the closest part of the *recess* (3.6) bottom

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

3.29

minimum sill height

$h_{s\min}$

minimum value of the *sill height* (3.28) required by this document

3.30

recess volume

V_C

volume of water that can be contained in a *recess* (3.6) before discharge

Note 1 to entry: It is the maximum volume, considering any combination of movable coamings, etc., measured from the *recess bottom* (3.11) up to the *recess retention height* (3.21), assuming that all opening *appliances* (3.20) and *drains* (3.22) are closed.

3.31

foot basin

specific *recess* (3.6) that satisfies the requirements of 10.3 of this document, located between a recess and a *companionway* (3.23) opening, and having a lower bottom than the surrounding recess

4 Symbols

[Table 2](#) gives the main symbols used in this document, with their meaning and unit.

Table 2 — Main symbols used in this document

Symbol	Meaning	Unit
B_H	Beam of hull as defined by ISO 8666:2016	m
F_M	Freeboard amidships as defined by ISO 8666:2016	m
h_C	Recess retention height	m
h_S	Sill height	m
$h_{S\ min}$	Minimum sill height	m
H_B	Recess bottom height above waterline	m
$H_{B\ min}$	Minimum recess bottom height above waterline	m
k_{DC}	Design category factor	—
L_H	Length of hull as defined by ISO 8666:2016	m
V_C	Recess volume	m ³
t_{max}	Maximum allowable draining time	min
t_{ref}	Reference draining time	min
d	Drain diameter	mm

NOTE Heights measured above the recess bottom have symbols beginning with *h*, whereas heights measured above waterline have symbols beginning with *H*.

5 General

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5.1 Loading and measurement conditions

Unless otherwise specifically stated in the text:

- the craft is in fully loaded, ready-for-use condition as defined in ISO 8666:2016;
- lengths and heights are measured in m, areas in m², volumes in m³, time in min and/or s;
- measurements or calculations shall be made with the craft upright and at rest in calm water.

5.2 Requirements for watertight and quick-draining recesses

[Table 3](#) summarizes the relevant clauses applicable to watertight and quick-draining recesses.

Table 3 — Relevant clauses for a recess to qualify as watertight or quick-draining

Requirements	Watertight recess	“Quick-draining” recess		
		Others	Open to the sea (3.10)	Reduced risk of flooding (7.2)
Watertightness	6.1	6.2	6.2	6.2
Companionway sill	None	Clause 7	Clause 7	None
Height of recess bottom	None	Clause 8	Clause 8	Clause 8
Drainage	None	Clause 9 or 10	None	None
Strength of appliances	ISO 12216:2020	ISO 12216:2020	ISO 12216:2020	ISO 12216:2020

6 Watertightness requirements

6.1 Watertightness requirements for watertight recesses

In watertight recesses, all surfaces and appliances shall have a degree of watertightness 1 up to a height of h_C .

6.2 Watertightness requirements for quick-draining recesses

All surfaces shall have a degree of watertightness 1.

The degree of watertightness of appliances installed in the surface of the quick-draining recess shall be as specified in [Table 4](#).

Table 4 — Degrees of watertightness of appliances

Location of appliances in the recess ^a	Degree of watertightness
appliance on bottom and sides up to $h_{S\min}$	2
appliance between $h_{S\min}$ and $2 h_{S\min}$	3
appliance above $2 h_{S\min}$	4

NOTE 1 On engine ventilation openings installed in a recess, a watertightness assessment can be performed using the total arrangement of exterior grid and internal ducts or swan's neck of the appliance, with material and connections sufficient to withstand the associated head of pressure.

NOTE 2 Additional requirements can be specified in other International Standards, such as ISO 12217 (all parts):2015.

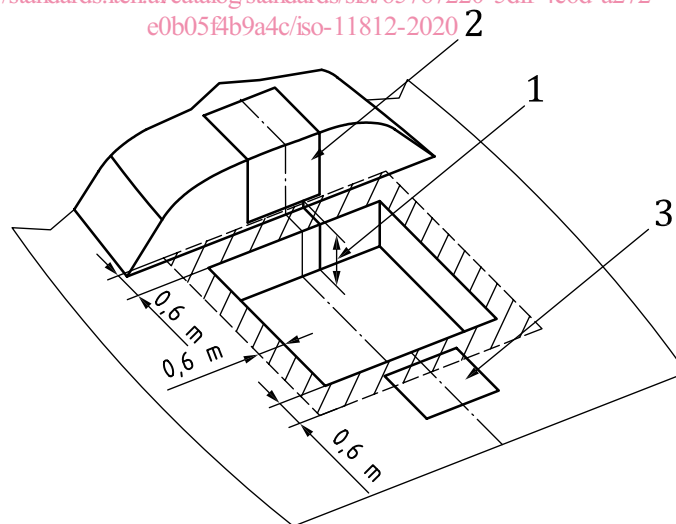
^a $h_{S\min}$ is defined in [Table 5](#), the local sill height and $h_{S\min}$ being measured as required by [7.3](#)

Opening appliances covering downflooding openings and installed on the surfaces of a quick-draining recess shall be secured in the closed position by a manually operated mechanical positive device.

7 Requirements for companionway sills

7.1 Companionway sills (standards.iteh.ai)

Any companionway inside the limits of the recess and those located within an area extending 0,6 m outside of the recess boundary shall comply with the requirements of this Clause (see [Figure 1](#)).



Key

- 1 sill height
- 2 front companionway door on bulkhead
- 3 aft companionway hatch on deck

Figure 1 — Sills considered and sill height measurement

7.2 Quick-draining recess with a reduced risk of flooding

A quick-draining recess with a reduced risk of flooding does not require a sill for any companionway opening if it complies with the following criteria:

- the craft is of a fully enclosed type according to ISO 12217 (all parts):2015;
- the recess is open to the sea, as defined in 3.10 of this document;
- all of the recess is located aft of the mid hull length of the craft;
- companionway(s) is(are) installed on the rear face of a superstructure;
- it has the lowest point of the companionway(s) opening higher than $[(L_h/17) + h_{S \text{ min}}]$ above the reference waterline;
- companionway opening appliance(s) is(are) permanently installed, enabling immediate closure.

7.3 Sill height measurement

The sill height is the lowest height of the companionway, as defined in 3.28.

The sill height shall be measured vertically from the adjacent closest point of the recess bottom to the lowest point of the upper sill edge (see Figure 1).

If a multi-bottom recess is fitted with a foot basin complying with the foot basin requirements of 10.3, the sill height shall be measured from the foot basin bottom; otherwise the sill height shall be measured from the closest recess bottom



7.4 Minimum companionway sill height for quick-draining recesses

ISO 11812:2020

Table 5 specifies the requirements regarding minimum companionway sill height for quick-draining recesses.

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These requirements do not apply to quick-draining recesses with a reduced risk of flooding.

Where a semi-fixed sill is fitted, the height of the fixed part shall be at least $(h_{S \text{ min}}/2)$.

Table 5 — Minimum companionway sill height, $h_{S \text{ min}}$, for quick-draining recesses

Dimensions in meters

Design category	Sailing monohulls minimum sill height, $h_{S \text{ min}}$	Non-sailing craft and sailing multihulls minimum sill height, $h_{S \text{ min}}$
A	0,30	0,20
B	0,25	0,15
C	0,15	0,10
D	0,05	0,05

NOTE The above requirements may be raised by other International Standards such as ISO 12217 (all parts):2015.

8 Height of recess bottom above waterline for quick-draining recesses

Table 6 specifies the minimum recess bottom height, $H_{B \text{ min}}$, above reference waterline, for quick-draining recesses.

For a single-bottom recess, H_B is measured at the centre of the surface of the bottom.

For a multi-bottom recess, H_B is measured at the centre of the surface of the lowest bottom.