DRAFT AMENDMENT
**ISO 11812:2020/DAM 1**

ISO/TC **188** Secretariat: **SIS**

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# Small craft — Watertight or quick-draining recesses and cockpits

## AMENDMENT 1

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

*AMENDEMENT 1*

ICS: 47.080

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**ISO/CEN PARALLEL PROCESSING**



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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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ISO 11812:2020 was prepared by Technical Committee ISO/TC 188, *Small craft*.

This amendment 1 to ISO 11812:2020 was prepared by ISO/TC 188, *Small craft*.

The main changes between this document and ISO 11812:2020.

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

## AMENDMENT 1

*Clause 2*

Replace first 2 references with the following:

ISO 8666:2020, *Small craft — Principal data*

ISO 9093:2020, *Small craft — Seacocks and through-hull fittings*

*Clause 3*

Replace definition 3.10 with the following:

**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 so to not retain water in the recess, with:

— a *recess retention height* (3.21) equal to zero; or

draining section area ($m^2$) of the recess greater than or equal to [0,05 $V_C$] ratio with $V_C$ in ($m^3$).

Note 1 to entry: Figure C.1 c) gives an example of a recess open to the sea.

Replace definition 3.21 with the following:

**3.21**
**recess retention height**
*h*C
height of a horizontal plane, measured from the recess bottom, below which the sum of open areas ($m^2$) leading to the outside of the craft is greater than $A_C/(LHBH)$ where $A_C$ is the area of the recess bottom, with all closing appliances closed when measuring the sum of these open areas.

Further, drains smaller than 25 mm in diameter or equal area shall not be part of this sum.

*Clause 7.2*

Replace 2nd indent with the following:

— the recess is open to the sea, as specified in 3.10 of this document;

*Clause 7.3*

Delete 1st paragraph and insert its content as a note after 2nd paragraph:

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

*Clause 7.4*

Replace 1st paragraph with the following:

Minimum companionway sill height for quick draining recesses shall comply with requirements specified in Table 5.

Replace 2nd sentence with the following:

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

Replace note of Table 5 with the following:

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

*Clause 8*

Replace 1st paragraph with the following:

For quick-draining recesses, minimum recess bottom height, $H_{B\ min}$, above reference waterline, shall comply with requirements specified in Table 6.

Replace 2nd paragraph with the following:

For a single-bottom recess, $H_B$ shall be measured at the centre of the surface of the bottom.

Replace 3rd paragraph with the following:

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

Replace note of Table 6 with the following:

NOTE Greater heights than these minimum values can be required to fulfil the maximum acceptable draining time according to Clauses 9 and 10.

*Clause 9.1*

Insert the following sentence at the end of Clause 9:

Where a foot basin is replaced by a horizontal opening, requirements of Clause 10.3 shall apply instead of Clause 9.

*Clause 9.2*

Replace last sentence of 1st paragraph with the following:

The simplified drainage assessment method of 9.3.2 shall be used if the following conditions are fulfilled:

— the minimum passage dimension inside any part of these devices has at least a section of 125 $mm^2$ (or a diameter of 12 mm), and

— the total entry cross-section is at least 1,5 times the internal cross-section of the drain.

Otherwise the drainage assessment shall be performed according to the full calculation method of Annex A or a test method.

To be used as drains, centreboard housings and other types of apertures where fitted shall comply with the following conditions:

— they are designed for this purpose, and

— they fulfil the other relevant requirements of Clause 9.

*Clause 9.3.1*

Replace 1st paragraph with the following:

The drainage calculation principle of this document for quick-draining recesses shall be based on a maximum draining time approach.

Replace 3rd paragraph with the following:

The draining time shall be the time elapsed to empty the recess between the retention height, $h_C$, and 0,1 m of the remaining water height.

Replace 2nd indent of 5th paragraph with the following:

— and full calculation method, as defined in Annex A, which gives more accurate results;

Replace last paragraph with the following:

If the draining section of the recess is greater than or equal to 0,05 $V_C$, this recess shall not require a draining time assessment.

*Clause 9.3.2*

Replace 1st paragraph with the following:

The following calculation method shall apply to single level bottom recesses.

*Clause 10.1*

Insert the following sentence at the end of Clause 10.1:

In multi-bottom recess, when recess bottom level adjacent to the companionway is not the highest recess bottom level, then requirements of draining calculations shall be made according to of Clause 10.3.2.

*Clause 10.2*

Replace content of 10.2 with the following:

### 10.2.1 Draining calculation requirements

To calculate the draining time of multi-bottom recess, the following step by step method shall apply:

Step 1 – Calculate the total volume, $V_C$, of the multi-bottom recess.

Step 2 – Calculate $t_{max}$ related to $V_C$ using Formula (1).

Step 3 – Calculate the time $t_{ref1}$ to drain the volume $V_1$ from $h_C$ to the highest bottom level.

Step 4 – Define the sub-volumes $V_n$ to drain for each remaining drainage system.

Step 5 – Calculate the draining times $t_{refn}$ of each sub-volume $V_n$ (see Formulas in Clause A.3).

Where one of these sub-volumes $V_n$ is open to the sea, no drainage calculation is required and $t_{refn} = 0$.

Step 6 – Calculate the sum of $t_{refn}$; when considering multiple sub-volumes draining at the same time, the longest draining time obtained shall be used in the draining time sum.

The maximum time elapsed to empty a multi-bottom recess from the retention height $h_C$ to a level of 0,1 m of remaining water height shall be less than $t_{max}$ calculated in step 1 of this process.

The remaining water height shall be calculated in the last sub-volume to drain.

### 10.2.2 Example of draining calculation application

Figure 3a provides an example of assessment for a multi-bottom level recess arrangement, where:

a) the volume *V*c is split into sub-volumes $V_1$, $V_2$, $V_3$, $V_4$ and $V_5$ according to the respective bottom levels;

b) $t_{ref1}$, $t_{ref2}$, $t_{ref3}$, $t_{ref4}$, and $t_{ref5}$ are the draining time of the respective sub-volumes $V_1$, $V_2$, $V_3$, $V_4$ and $V_5$;

c) the longest draining time sum from $[t_{ref1}+t_{ref2}+t_{ref3}]$ or $[t_{ref1}+t_{ref4}+t_{ref5}]$ shall be less than $t_{max}$.

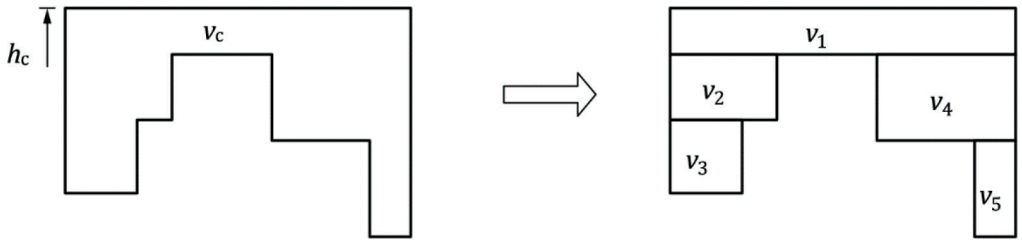



**Figure 3a — Side view example of multi-bottom recess arrangement assessment**

*Clause 10.3*

Replace Clause 10.3 with the following:

### 10.3.1 General requirements for a foot basin

If a foot basin is used to reduce the sill height relative to the recess bottom, the additional requirement of this clause shall apply to minimizing ingress of water by ensuring it drains quickly before reaching the top of the sill.

In addition to the requirements of 10.1 and 10.2, as a specific recess of a multi-bottom recess, a foot basin shall comply with the requirements of Table 9.

As an exception for multihull, sill height requirement do not apply where the foot basin is replaced by an horizontal opening:

— complying with table 9 minimum width, length, location and grating permeability, companionway door requirements and;

— giving way directly to the open sea with a minimum section of 80 % of the total required area of the grating and;

— designed to prevent ingress of water from the sea.

**Table 9 — Requirements for a foot basin**

| Characteristics of the foot basin[a] | Requirements |
|---|---|
| Minimum width | ≥ 90 % of the maximum width of companionway opening |
| Minimum length[b] | The length of the upper part of the foot basin (normal to the companionway width) shall be:<br>between 2 × *h*S min and 4 × *h*S min |
| Minimum depth[c] | The depth (below upper level of the adjacent recess bottom) shall not be less than:<br>1 × *h*S min |
| Minimum volume[d] | The volume below the sill shall be at least:<br>3*h*S min$^2$ x *Minimum width* |
| Location | Immediately in way of companionway opening(s), see Figure 4 |
| Grating permeability | The grating permeability shall be:<br>equally spread on the total area of the grating, ≥ 25 % |
| Sill height measurement | The sill height shall be measured from the bottom of the foot basin |
| Companionway door | Companionway opening appliance(s) shall be permanently installed, enabling immediate closure |

[a] If the total drainage area is > 25 % of the foot basin bottom area, a device protecting water surging from below shall be provided.

[b] This requirement prevents the water rebounding on the grating and flooding inside the interior. A foot basin with a length greater than 4 x $h_{S\,\min}$ is no longer considered as a foot basin but as a recess.

[c] The length and the width of the foot basin is measured at the minimum depth required *h*S min.

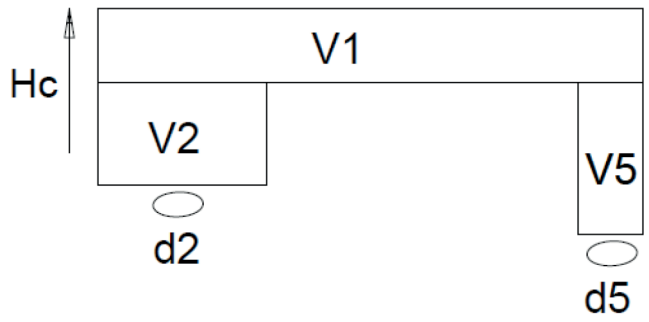
[d] To calculate the volume of the foot basin, the depth used is the lowest of the actual depth and the actual sill height.

### 10.3.2 Drainage requirements for a foot basin

Figure 3b shows a side view example of a multi-bottom recess with foot basin in order to illustrate the way to handle draining time calculations.

The drainage calculations shall be made by following process from Clause 10.2.

In addition to these calculations, another draining time calculation shall be made according to $t_{max}$ values from Table 10 for [V5] draining time calculations.




**Key**

| | | | |
|---|---|---|---|
| V1 | Volume of the main level in a multiple bottom recess | Hc | Retention height |
| V2 | Sub-volume of a multiple bottom recess | d2 | Main recess drain of a multiple bottom recess |
| V5 | Foot basin volume in front of companionway door | d5 | Foot basin drain |

**Figure 3b — Side view example of multi-bottom recess arrangement with foot basin**

If the total drainage area is >25 % of the foot basin bottom area, the foot basin bottom shall be designed to prevent water surging from below.

The maximum draining time shall comply with the requirements specified in Table 10, assessed for drainage until 0,10 m remaining height of water on its bottom.

**Table 10 — Drainage of a foot basin fitted in multiple-bottom recess**

Time in minutes

| Recess type | Maximum foot basin draining time |
|---|---|
| Multi-bottom recess open to the sea | 0,05 *t*max |
| Multi-bottom recess not open to the sea | 0,1 *t*max |

*Clause A.1*

Replace 1st paragraph with the following:

NOTE An explanation of the source of the Formulas of this Annex can be found in Annex B.

*Clause A.3*

Replace 1st paragraph with the following:

The process in 10.2 shall be followed for this assessment.

*Replace 3rd paragraph with the following:*

$h_c$ shall be considered as the total height from lower level bottom to top of water retention height in the upper level, and not the water retention in the upper sub-recess ($h_c$-$h_i$), see Figure A.2.

*Clause A.4*

Replace 1st paragraph with the following:

NOTE If the two drains or more have different diameters, the draining time assessment can be complex as the water flows in each drain are different. Annex B specifies basics approach to handle it.

*Clause A.5.1*

Replace content of this subclause with the following:

### A.5.1.1 Information to consider for head loss calculations

Seacocks are considered fully open and are therefore not considered as a specific head loss cause.

In general, each draining system of a recess has a minor loss at the entry and at the outlet, plus eventual intermediate minor losses due to elbows / changes of direction, or sudden change of section.

This document only considers the main cases. Typical values of additional head losses are listed in this clause. Other methods are existing, but they are not considered as the baseline of this document.

### A.5.1.2 Requirements based on Table A.5

Values of head loss K shall be defined or calculated according to the requirements of Table A.5.

Where the section is not circular, an equivalent diameter shall be used.

**Table A.5 — Calculated or default values of *K* for various discontinuities**

| | Type of fitting | Discontinuity | Formula or data | $c_q = \sqrt{1+K}$ |
|---|---|---|---|---|
| Entry of drain piping system | Entry with sharp angles | Sudden contraction | $K = \left(1 + S_1 / S_E\right)^{2}$ [b] | 1,23 |
| | Entry with chamfered angle | | | 1,12 |
| | Entry with rounded angles | | See Table A.7 | 1,06 |
| | Grid of round holes or grating | | See Table A.10 | 1,73 |
| Outlet of piping system | Outlet discharge above $W_L$ | Sudden expansion | 0 | 0,00 |
| | Outlet discharge below $W_L$ | | $= \left(1 + S_1 / \infty\right)^2$ | 1,00 |
| Flow changes inside drain system | Round elbow | Flow change | See Table A.8 or A.9 | 1,17 |
| | Sharp elbow | | See Table A.10 | 1,46 |
| | Sudden expansion | | $K = \left(1 + S_2 / S_1\right)^2$ | |
| | Sudden contraction | | $K = \left(1 + S_1 / S_E\right)^2$ | |

[a] A freeing port is an aperture in the wall of the recess with no drain piping, see Figure 5. It can be fitted with a flap preventing water to enter back but slowing the flow.

[b] In case of sudden contraction (drain entry and change in diameter), the flow contracts into a section SE usually 0,75 times the actual section $S_2$.

*Annex D*

Add the following annex.

# Annex D
(informative)

# Main changes brought into this document

Annex D provides details of significant changes between this document and ISO 11812:2020.

**Table D.1 — Main changes**

| Clause/Paragraph/Table/Figure | Change |
|---|---|
| 1 / Scope | ISO 8666 has been removed from the scope. |
| 2 / Normative references | Update of the references. |
| 3 / Terms and definitions | Update of the definitions. |
| 4 / Symbols | Revision of the Clause. |
| 5 / General | Revision of the Clause. |
| 6 / Watertightness requirements | Revision of the Clause. |
| 7 / Requirements for companionway sills | Revision of the Clause. |
| 8 / Height of recess bottom above waterline for quick-draining recesses | Revision of the Clause. |
| 9 / Quick-draining recesses – Single bottom recess drainage | Revision of the Clause. |
| 10 / Quick-draining recesses – Multi-bottom recess drainage | Revision of the Clause. |
| 11 / Owner's manual | Revision of the Clause. |
| Annex A / Full calculation method for draining time | Update of the Annex. |
| Annex B / Technical background | No changes. |
| Annex C / Examples of quick-draining recesses | No changes. |
| Annex D/ Main changes | New Annex introduced. |
| Annex H / Significant changes between this document and the previous edition | New Annex introduced. |
| Annex ZA / Relationship between this Standard and the Essential Requirements of EU Directive 2013/53/EU | Revision of the Annex. |
| NOTE The technical changes referred include the significant technical changes from the ISO revised but is not an exhaustive list of all modifications from the previous version. | |

# 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 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, 3.5 a) and b) Flooding | 5, 6, 7, 8, 9, 10 (except 10.2.2)<br><br>Annex A (except A.1 and A.5.2.2) | The scope of this document is wider than that of Article 2.1.(a) of Directive 2013/53/EU in that it includes craft with a Load Line Length of up to 24m which may be considerably longer that craft with length of hull to 24m. Craft in excess of hull length to 24m are excluded from the correspondence between this standard and Annex I of Directive 2013/53/EU.<br><br>This standard deal with recesses and cockpits that are drained by gravity. It does not deal with removal of water by pumps or other means.<br><br>This standard only considers ventilation openings installed on the surfaces of a quick-draining or watertight recess. |
| Annex I, Part A, 2.5 | 11 | Owner's manual |

**Table ZA.2 — Applicable Standards to confer presumption of conformity as described in this Annex ZA**

| Column 1<br>Reference in Clause 2 | Column 2<br>International Standard Edition | Column 3<br>Title | Column 4<br>Corresponding European Standard Edition |
|---|---|---|---|
| ISO 8666:2020 | ISO 8666:2020 | *Small craft — Principal data* | EN ISO 8666:2020/A11:2021 |
| ISO 9093:2020 | ISO 9093:2020 | *Small craft — Seacocks and through-hull fittings* | EN ISO 9093:2021 |
| ISO 12216:2020 | ISO 12216:2020 | *Small craft — Windows, portlights, hatches, deadlights and doors — Strength and watertightness requirements* | EN ISO 12216:2022 |
| ISO 12217-1:2022 | ISO 12217-1:2022 | *Small craft — Stability and buoyancy assessment and categorization — Part 1: Non-sailing boats of hull length greater than or equal to 6 m* | EN ISO 12217-1:2023 |
| ISO 12217-2:2022 | ISO 12217-2:2022 | *Small craft — Stability and buoyancy assessment and categorization — Part 2: Sailing boats of hull length greater than or equal to 6 m* | EN ISO 12217-2:2023 |
| ISO 12217-3:2022 | ISO 12217-3:2022 | *Small craft — Stability and buoyancy assessment and categorization — Part 3: Boats of hull length less than 6 m* | EN ISO 12217-3:2023 |

The documents listed in the Column 1 of table [ZA.2], in whole or in part, are normatively referenced in this document, i.e. are indispensable for its application. The achievement of the presumption of conformity is subject to the application of the edition of Standards as listed in Column 4 or, if no European Standard Edition exists, the International Standard Edition given in Column 2 of table [ZA.2].

**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.**