International Standard

ISO 15085

Second edition
2024-07

Small craft — Protection from falling overboard and means of reboarding

Petits navires — Prévention des chutes par-dessus bord et remontée à bord

Reference number
ISO 15085:2024(en)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 General requirements **4**
4.1 Prevention from falling overboard 4
4.2 Deck zones 4
4.3 Required safety devices 5
4.4 General requirements for deck zones 7
4.4.1 All deck zones 7
4.4.2 Deck zones Z1 and Z2 7
4.5 Requirements for operation and storage temperature of safety devices 8
4.5.1 Operation temperature 8
4.5.2 Storage temperature 8

5 Slip-resistant surfaces **8**
5.1 General 8
5.2 Requirements for trampolines and nets 8

6 Foot-stops **8**
6.1 General 8
6.2 Foot-stops requirements 8
6.3 Minimum foot-stops height and angle 9
6.4 Foot-stops made of angled surfaces 10
6.5 Maximum clearance between deck and foot-stop 10
6.6 Continuity on the deck zone level in vicinity of foot-stop 10
6.7 Gaps in the foot-stop rail 10

7 Handholds **10**
7.1 General 10
7.2 Location in vicinity of outer deck edge 10
7.3 Strength 11

8 Barriers to falling overboard **11**
8.1 General 11
8.2 Geometric requirements for barriers to falling overboard 11
8.2.1 Height of barriers to falling overboard 11
8.2.2 Openings in barriers to falling overboard 12
8.3 Additional requirements for sailing boats 13
8.3.1 Bow pulpits for sailing boats 13
8.3.2 Transom barriers to falling overboard for sailing boats 13
8.3.3 Forward cross beams of sailing catamarans 14
8.3.4 Central hull of sailing trimarans 14
8.4 Risk of falling overboard from elevated deck zones 14
8.5 Barrier to falling overboard design and strength requirements 16
8.5.1 General requirements 16
8.5.2 Requirements for guard-rails or low guard-rails 16
8.5.3 Requirements for guard-lines 16
8.5.4 Requirements for stanchions or guard-line supports 17

9 Hooking points **17**
9.1 General 17
9.2 Location 17
9.3 Location for habitable multihull craft susceptible to inversion 18
9.4 Size 18
9.5 Strength 18

10 Attachment points for jack-lines **18**
10.1 General 18
10.2 Fitting 18
10.3 Strength 18
11 Prevention of falling overboard from high-speed craft **19**
11.1 General 19
11.2 Additional requirements for handholds 19
11.3 Body support 20
11.4 Seat fixing strength 20
12 Toe straps for sailing dinghies **20**
13 Means of reboarding **20**
13.1 General requirements 20
13.2 Requirements for rigid ladder 21
13.3 Requirements for non-rigid ladder 23
13.4 Reboarding test 24
14 Owner's manual **24**
Annex A (normative) **Test of seats for high-speed craft** **25**
Bibliography **30**

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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 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,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 464, *Small Craft*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15085:2003), which has been technically revised. It also incorporates the Amendments ISO 15085:2003/Amd 1:2009 and ISO 15085:2003/Amd 2:2017.

The main changes are as follows:

— simplification of the document's arrangement;

— creation of a new approach with requirements based on risk assessment principles of deck zones;

— definition of "normal operation" and a longer list of functions to ensure safety;

— replacement of requirements for guard-rail and guard-line systems with a single concept of "falling overboard barrier";

— improvement of requirements on high speed craft;

— requirements for toe straps for sailing dinghies;

— amendment of means of reboarding.

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 — Protection from falling overboard and means of reboarding

1 Scope

This document specifies the design as well as the construction and strength requirements for safety devices and arrangements intended to minimize the risk of persons falling overboard, and requirements to facilitate reboarding from the water, unaided, on small craft.

This document is applicable to the risk of falling overboard and does not apply to falling within the limits of the deck zone.

This document includes the use of toe straps for hiking out on small sailing boats, but it does not apply to the use of trapezes or similar devices that are designed to allow crew to operate sailing boats with their bodies entirely outside the periphery of the craft.

This document does not apply to the following small craft types:

— canoes, kayaks;

— personal watercraft including powered surfboards.

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 8666:2020, *Small craft — Principal data*

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*

ISO 12217-3:2022, *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 terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
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 measurement methodology for the length of hull is defined in ISO 8666.

[SOURCE: ISO 8666:2020, 3.15, modified — Note 1 to entry added.]

3.2
personal watercraft
watercraft intended for sports and leisure purposes, of less than 4 m in hull length, which uses a propulsion engine having a water jet pump as its primary source of propulsion and designed to be operated by a person or persons sitting, standing, or kneeling on, rather than within the confines of a hull

Note 1 to entry: The measurement methodology for the length of hull is defined in ISO 8666:2020.

[SOURCE: ISO 13590:2022, 3.1]

3.3
design category
description of the sea and wind conditions for which a boat is assessed to be suitable

Note 1 to entry: The design categories are specified in ISO 12217-1.

3.4
sailing boat
craft (3.1) for which the primary means of propulsion is by wind power, having reference sail area $(A_S) \geq 0{,}07(m_{LDC})^{2/3}$

Note 1 to entry: A_S is expressed in m^2 and m_{LDC} is expressed in kg.

[SOURCE: ISO 8666:2020, 3.11, modified — Note 1 to entry added.]

3.5
non-sailing boat
craft (3.1) for which the primary means of propulsion is other than by wind power, having reference sail area $(A_S) < 0{,}07(m_{LDC})^{2/3}$

Note 1 to entry: A_S is expressed in m^2 and m_{LDC} is expressed in kg.

[SOURCE: ISO 8666:2020, 3.10, modified — Note 1 to entry added.]

3.6
high-speed craft
craft (3.1) having a maximum speed, in knots, greater than $7\sqrt{L_H}$ or 25 knots, whichever is the greater

Note 1 to entry: the conversion factor at the first instance: 1 knot = 1,852 km/h.

3.7
working deck
external deck areas defined by the manufacturer for people to stand or walk during *normal operation* (3.27) of the *craft* (3.1), -assigned into different *deck zones* (3.8)

3.8
deck zone
working deck (3.7) area of the *craft* (3.1) where there is a risk of falling overboard during *normal operation* (3.27) of the craft

3.9
safety device
device that is used to prevent falling overboard or provide reboarding functions, either on its own or as a part of a system

Note 1 to entry: Table 2 provides list of safety devices considered by this document.

3.10
slip-resistant surface
surface intentionally provided to increase grip between the foot (or shoe) and the surface of the deck

3.11
foot-stop
feature which provides a barrier or support for the foot

3.12
barrier to falling overboard
permanent structure designed to restrain person from falling overboard made of *guard-rails* (3.13), *guard-lines* (3.14), *coamings* (3.17), bulwark or other elements, or combination of such

3.13
guard-rail
system of rigid structure designed to restrain person from falling overboard

3.14
guard-line
system of flexible lines supported by rigid structures or *stanchions* (3.15) designed to restrain person from falling overboard

3.15
stanchion
upright bar or pole carrying a *guard-rail* (3.13) or *guard-line* (3.14)

3.16
pulpit
pushpit
rigid frame replacing or extending a *guard-rail* (3.13) or *guard-line* (3.14)

3.17
coaming
raised part of the deck or superstructures

3.18
handhold
device or part of the *craft* (3.1) intended to be gripped by hand to reduce the risk of falling overboard, even if it is not its main function

3.19
hooking point
specific device, *jack-line* (3.20) or part of the *craft* (3.1) to which people can directly attach the hook of a safety harness, even if it is not its main function

3.20
jack-line
flexible line or rigid bar intended for the attachment of the line of a safety harness and allowing movement along its length

3.21
reboard
action of a person to climb aboard a *craft* (3.1) from the water

3.22
means of reboarding
rigid or flexible device or part of the hull which allows a person to *reboard* (3.21) unaided

3.23
strong point
fitting on a *craft* (3.1) designed to be used for the attachment of anchor chains, anchor lines, tow lines or warps

3.24
body support
part of the *craft* (3.1) intended to provide support to the body of an occupant while underway

3.25
seat
surface, horizontal or nearly horizontal, intended for a person to sit, with minimum dimensions of 400 mm width by 750 mm length inclusive of clear foot space in front of the seat

3.26
outer deck edge
outboard deck edge at the periphery of the *craft* (3.1)

EXAMPLE Gunwale.

3.27
normal operation
use of the product in the manner for which it is intended, and in accordance with the specifications, instructions and information provided by the manufacturer

3.28
toe strap
device for retaining the crew's feet such that they can hike, i.e. extend their bodies beyond the periphery of the boat, in order to balance the *craft* (3.1), without falling overboard

4 General requirements

4.1 Prevention from falling overboard

To minimize the risk of falling overboard, the craft shall provide safe access to and use of areas required for its safe operation.

According to the type of the craft, the intended use and the design category, there shall be:

— deck zones assigned according to 4.2;

— safety devices installed to these deck zones according to 4.3.

There can be areas which are not intended to accommodate persons during normal operation. Those areas are not considered to be part of the deck zones, but they shall be described in the craft owner's manual.

4.2 Deck zones

Table 1 assigns deck zones to areas of the craft.

The craft shall accommodate the maximum recommended number of persons in a combination of deck zone Z1, and the interior of the craft.

Where different maximum recommended number of persons are assigned to different design categories for a craft, it shall be ensured the requirements of this document are met for each design category.

Table 1 — Deck zones

Deck zones Z1 to Z3		
Z1	**Z2**	**Z3**
Deck areas that require access at any time, including at least the following:	Deck areas that require access at a speed of 4 knots and below, including at least the following:	Deck areas that require access when nearly stationary including at least the following:
— helm position — emergency steering position — emergency controls[a] — manual bilge pump(s) — sail setting equipment[b] — primary controls areas for furling, unfurling, hoisting, dropping sails — main companionway(s) — areas within the zone where persons stand, lean, lay or sit	— engine space — emergency steering installation — tow points — sail hoist, drop areas for non-furling sails — areas within the zone where persons stand, lean, lay or sit — life raft stowage	— mooring strong points — means of reboarding — boarding area — areas within the zone where persons stand, lean, lay or sit
[a] Examples of emergency controls: fuel shut-off release, fire extinguisher release, battery disconnect switch, LPG shut-off valve.		
[b] Examples of sail setting equipment: main sail and genoa winches.		

4.3 Required safety devices

The requirements given in Tables 3 and 4 shall apply. For each option related to a design category, the corresponding safety devices shall be identified by their index number from Table 2.

When required, the safety devices shall fulfil all the requirements of the relevant clause.

In addition to the requirements set in Tables 3 and 4:

— for all craft, the means of reboarding the requirements of Clause 13 shall apply;

— all craft with several working deck levels where the crew can access shall fulfil the requirements of 8.4;

— habitable multihulls susceptible to inversion shall fulfil the requirements of 9.3.

NOTE 1 ISO 12217-1:2022, ISO 12217-2:2022 and ISO 12217-3:2022 provide requirements to define habitable multihulls susceptible to inversion.

Table 2 provides the list of safety devices.

Table 2 — List of safety devices

Index	Safety devices	Clause
1	Slip-resistant surface	Clause 5
2	Foot-stop	Clause 6
3	Handholds	Clause 7
4	Low barriers to falling overboard	Clause 8
5	High barriers to falling overboard	Clause 8
6	Hooking points	Clause 9
7	Falling overboard prevention on high-speed craft (where relevant)	Clause 11
8	Jack-line attachment points	Clause 10