INTERNATIONAL STANDARD

ISO 15085

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Small craft — Man-overboard prevention and recovery

Petits navires — Prévention des chutes d'homme à la mer et remontée à bord

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Contents

Page

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 15085 was prepared by Technical Committee ISO/TC 188, *Small craft*.

Introduction

This International Standard is based on the idea that safety on board of small craft is not obtained through one simple safety item, but through the conjunction of several items.

It is also based on the knowledge that there is not one single set of safety items per design category and boat type, but several. In some instances, it therefore provides the boat builder with different options according to the general use he intends for the boat, within its design category.

The main issue is the definition of the working deck, up to the boat builder, and as people present on the working deck under normal operation, i.e. under way, shall be protected. This definition is of major importance. For example, on some boats the working deck is limited to the cockpit, whereas in others it encompasses the whole deck area.

Access to and use of strong points is a separate issue and is therefore treated differently: this access and use is needed, but not necessarily when the boat is under way and never at full speed, hence not necessarily on the working deck.

Small craft — Man-overboard prevention and recovery

1 Scope

This International Standard specifies the design as well as the construction and strength requirements for safety devices and arrangements intended to minimize the risk of falling overboard, and requirements to facilitate reboarding.

It describes means which can be used individually or combined to achieve these objectives, and applies to small craft of up to 24 m length of hull.

This International Standard is not applicable to the following boat types:

— aquatic toys;

— canoes, kayaks, or other boats with a beam less than 1,1 m;

— personal watercraft, covered by ISO 13590;

— inflatable boats with a hull length of less than 8 m, covered by ISO 6185.

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 8666:2002, *Small craft — Principal data*

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

3 Terms and definitions

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

3.1
design category
description of the sea and wind conditions for which a boat is assessed to be suitable

NOTE The applicable design categories are summarized in Table 1.

Table 1 — Definitions of the design categories

Design category	Wind speed (Beaufort scale)	Significant wave height m
A - “Ocean”	> 8	> 4
B - “Offshore”	⩽ 8	⩽ 4
C - “Inshore”	⩽ 6	⩽ 2
D - “Sheltered waters”	⩽ 4	⩽ 0,3

3.2
length of hull
L_H
length of the hull according to ISO 8666

NOTE Length of hull is expressed in metres (m).

3.3
sailing boat
boat designed to use sails as its primary means of propulsion, as defined in ISO 8666

3.4
non-sailing boat
boat not corresponding to the definition of a sailing boat

EXAMPLE Motor-boat, rowing boat.

3.5
high-speed boat
motor boat having a maximum speed, in knots, greater than 10 $\sqrt{L_H}$ or 25 knots, whichever is the greater

3.6
working deck
external areas defined by the boat builder for people to stand or walk during normal operation of the boat

NOTE 1 The working deck is normally composed of rigid parts of the boat, such as decks, coach-roofs, superstructures, flying bridges, etc. but may also consist of flexible parts, such as trampolines and nets.

NOTE 2 On some boats the working deck is limited to the cockpit, the foredeck only being used for access to strong points.

NOTE 3 Unless specifically stated by the boat builder, areas having an inclination of more than 25° to the horizontal in a longitudinal direction, or more than 30° in a transverse direction, are not considered to be part of the working deck.

3.7
slip-resistant surface
surface intentionally prepared, machined, covered, moulded, etc. to provide increased adherence between the foot (or shoe) and the surface of the deck

EXAMPLE Paint with “non-slip” characteristics, diamond head patterned moulded deck, “non-skid” covering, unpainted wooden decks, trampolines.

3.8
foot-stop
machined, moulded or fitted, relief or projection of the deck, or any other device, which provides a barrier or a support for the foot when the boat is heeling or rolling

EXAMPLE Toe rails, bulwarks, coamings.

3.9
guard-rail
permanent rigid structure designed to restrain people from falling overboard

NOTE An intermediate line/rail may be required (see clause 10), which may be flexible.

EXAMPLE Timber, or metallic rigid rail.

3.10
guard-line
system of flexible lines supported by rigid structures or stanchions, designed to restrain people from falling overboard

NOTE An intermediate line/rail may be required (see clause 10), which may be flexible.

3.11
stanchion
vertical bars or poles carrying guard-rail or guard-line

3.12
pulpit
rigid frame replacing or extending a guard-line or guard-rail

EXAMPLE Stem pulpit, mast pulpit, stern pushpit.

NOTE Usually, pulpits are forward of the boat and pushpits are aft.

3.13
coaming
raised part of the deck or superstructures, often used to reduce the ingress of water in a protected area

3.14
handhold
any part of the boat that may be gripped by hand to reduce the risk of falling overboard, even if it is not its main function

EXAMPLE Handle, shroud, seat edge, cleat, top of windscreen, steering wheel, foot strap of sailing dinghy.

3.15
hooking point
eye, fitting, or any device to which people can clip directly a safety harness and be able to move around an area of the working deck, even if it is not its main function, for example jack-line, shroud, rod chainplate

3.16
jack-line
flexible line or rigid bar intended for attachment of the safety harness allowing safe movement of the crew along its length when attached

3.17
reboarding means
rigid or flexible fitting or part of the hull which allows a person to reboard without assistance

3.18
strong point
point used for one of the following purposes; an item may have a multiple purpose:

— anchoring;

— mooring;

— towing or being towed

4 General requirements

4.1 Functions of the working deck

Safe access to the following areas shall be provided either via the working deck, the interior of the boat or combination thereof:

— boat steering including emergency steering;

— strong points;

— sail handling and trimming;

— interior;

— engine room compartment.

If appropriate, a text or a sketch in the owner's manual shall indicate the working deck area(s) as defined by the boat builder.

4.2 Means of protection

Protection against falling overboard from the working deck shall be achieved by applying one of the relevant options as listed in Table 3 or Table 4, taking into account the type or design of the craft and the intended use, within the limits of the design category chosen.

It is possible to apply different options to specific areas of the boat.

4.3 Minimum width of decks

In order to enable a safe foot treading, the working deck area adjacent to the outer deck edge, whether lateral or longitudinal, shall both

— be free, continuous and not angled transversally more than 15° from the horizontal, when the boat is upright

— have a width of at least 100 mm for design category D, 120 mm for category C, and 150 mm for category A or B

measured perpendicular

— to the foot stop inner limit or

— the lateral outer deck edge of the deck if there is no foot stop.

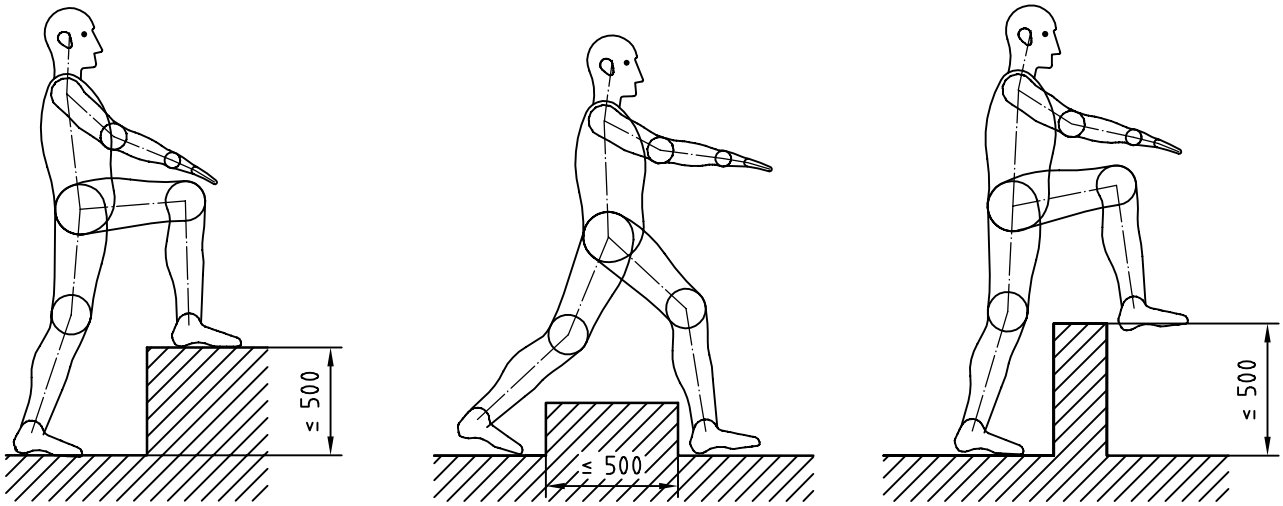
NOTE The above requirements imply that deck areas having a width less than required above cannot be considered as part of the working deck, and that adjacent wide side or aft cockpit coamings need to fulfil the requirement of lateral deck, like, for example, the ones on guard-rail height of clause 10, if relevant.

4.4 Continuity of the working deck

Working deck areas shall be connected, this may include passage through the interior.

Special provision shall be made where changes in elevation or obstacles have to be surpassed. Steps higher than 500 mm [see Figure 1 a)] and obstacles higher or longer than 500 mm shall be avoided [see Figures 1 b) and 1 c)].

Dimensions in millimetres



a) Step **b) Long obstacle** **c) High obstacle**

Figure 1 — Diagram illustrating some requirements of 4.4

5 Safety devices

The specific requirements for each safety device are given in clause 6.

Table 2 lists the nine different safety devices and the clause numbers where their requirements are described.

Table 2 — List of safety devices

Number	Name of safety device	Clause to be considered
1	Slip resistant surface	7
2	Foot-stop	8
3	Handholds	9
4	Low guard-rail or low guard-line ($h \geqslant 450$ mm)	10, 11
5	High guard-rail or high guard-line ($h \geqslant 600$ mm)	11, 12
6	Hooking points	13
7	Jack-line attachment points	14
8	Body support on high-speedboat (if relevant)	15
9	Means of reboarding	16
NOTE The safety devices are not listed in order of importance: devices 1 to 5 are placed in the Table starting from deck level upwards, device 8 is only relevant on high-speed boats, device 9 is required on any boat.		

6 Tables of requirements

6.1 General

The requirements are presented in Tables 3 and 4. For each design category, an “X” signifies that the corresponding safety device is required.

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

6.2 Requirements for non-sailing boats

For design category B, there are two options (2 and 3) available to the boat builder.

NOTE The different options of Table 3 allow the flexibility corresponding to the wide range of designs.

Table 3 — Requirements for non-sailing boats

Safety device	No.	Options					
		1	2	3	4	5	6
		Design category					
		A	B $L_H > 8{,}5$ m	B $L_H \leqslant 8{,}5$ m	B	C	D
Slip resistant surface	1	X	X	X	X	X	X
Foot-stop	2	X	X	X	X		
Handholds	3	X	X	X	X	X	X
Low guard-rail or low guard-line	4			X			
High guard-rail or high guard-line	5	X	X				
Hooking points	6	X			X		
Body support on high-speedboat(if relevant)	8	X	X	X	X	X	X
Means of reboarding	9	X	X	X	X	X	X

NOTE 1 For any category, the requirements for a higher design category may be used.

NOTE 2 A handhold meeting the requirements of clause 13 may also be a hooking point.

NOTE 3 The options can be mixed, provided that the minimum requirement of the category is satisfied.

EXAMPLE A guard-rail meeting the requirement for handholds located less than 300 mm of the working deck edge forward and handholds aft.

6.3 Requirements for sailing boats

The following options are available to the boat builder, for design category B there are two options (2 and 3) according to the boat size.

For design category C, there are four options (2, 3, 4 and 5) according to boat size and type.

NOTE The different options of Table 4 allow the flexibility corresponding to the wide range of designs.

Table 4 — Requirements for sailing boats

Safety device	No.	Options					
		1	2	3	4	5	6
		Design category					
		A	B and C $L_H > 8{,}5$ m	B and C $L_H \leqslant 8{,}5$ m	C[a] daytime	C[b]	D
Slip resistant surface	1	X	X	X	X	X	X
Foot-stop	2	X	X	X	X		
Handholds	3	X	X	X	X	X	X
Low guard-rail or low guard-line	4			X			
High guard-rail or low guard-line	5	X	X				
Hooking points (see Note 2)	6	X	X	X	X		
Jack-line attachment points	7	X	X	X			
Means of reboarding	9	X	X	X	X	X	X

NOTE 1 For any category, the requirements for a higher design category may be used.

NOTE 2 A handhold meeting the requirements of clause 13 may also be a hooking point.. See also the hooking points requirements for inverted sailing multihulls in 13.2.

NOTE 3 The options can be mixed, provided that the minimum requirement of the category is satisfied.

[a] Option 4 is limited to boats intended for daytime navigation only, i.e. not during night. This information shall be inserted in the owner's manual.

[b] Option 5 is limited to sailing boats, either capsize or knockdown recoverable or fitted with flotation according to ISO 12217.

EXAMPLE A guard-rail meeting the requirement for handholds located less than 300 mm of the working deck edge forward and handholds aft.

7 Specific requirement for slip-resistant areas

7.1 General

Working deck areas shall be slip-resistant. These surfaces need not be continuous, but the spacing between slip-resistant patches shall not be greater than

— 75 mm for non-glazed areas;

— 500 mm for glazed areas, unless the lateral sides of the area are fitted with foot stops according to clause 8.

NOTE 1 “Glazed area“ means area covered with translucent material such as glass, acrylic, polycarbonate, etc.

NOTE 2 The second requirement allows the common practice of deck hatches 500 mm × 500 mm not fitted with slip-resistant surfaces, and stepped over, whereas 600 mm × 600 mm hatches needs slip-resistant patches.

On sailing dinghies, slip resistant surfaces need not be placed everywhere, but only where people are supposed to tread.

7.2 Requirements for trampolines and nets

Trampolines and nets which are part of the working deck shall have slip-resistant characteristics.

Any opening within the working deck area having a depth greater than 1 m and not provided with a hatch or lid shall be surrounded by guard-rails as required in clause 9 or fitted with trampolines or nets.

EXAMPLE Opening between hulls on a catamaran.

The junction between the trampolines or nets and the boat shall not involve any risk of foot trapping.

The connection of trampoline and nets to the boat shall be strong enough to support a uniform load of 3 000 N/m^2 or 50 % of the maximum allowed crew capacity, whichever is smaller.

8 Requirements for foot-stops

8.1 General

Figure 2 shows a few examples of foot-stops.

When required by clause 6, foot-stops shall meet the requirements given in 8.2 to 8.7.

8.2 Provision of foot-stops

Foot-stops shall be provided as close as practicable to the outboard edges of the working deck.

Foot-stops are not required on the following:

— capsize-recoverable sailing dinghies;

— parts of the working deck where people are not intended to walk but only sit when the boat is underway, such as sailing-boat deck edge where the crew hikes;

— the aft limit (perpendicular to the longitudinal axis) of monohull working deck, e.g. top of transoms;

— the aft limit (perpendicular to the longitudinal axis) of the rigid part of multihull working deck;

— front and aft beams (perpendicular to the longitudinal axis) of multihulls.

8.3 Minimum foot-stop height and angle

The height of the upper edge of the foot-stop above the adjacent working deck level shall be not less than:

— for boats of design category C:

  — 25 mm for sailing boats,

  — 20 mm for non-sailing boats;

— for boats of design category A and B:

  — 30 mm for sailing boats,

  — 25 mm for non-sailing boats.

These heights are the smallest distances, measured perpendicularly to the deck, from the highest inner point of the foot-stop to the highest point of the deck within 100 mm of the foot-stop [see Figure 2 a)].

If the edges of the foot-stop have a fillet radius greater than 5 mm, the height of the foot stop shall be measured between the closest points of these fillets [see Figure 2 b)].

To stop the foot from slipping outboard, the angle in the internal face (or of a tangent to it) shall not be more than 30° from the vertical [see Figure 2 c)], except on non-sailing boats using the device described in 8.4 (for non-sailing boats only).

8.4 Foot-stops made of angled surfaces

Angled surfaces foot-stops are allowed on non-sailing boats of design categories C and D. These surfaces shall have an inclination of not less than 20° from the horizontal and a height according to 8.3 [see Figure 2d)].

These angled surfaces shall be slip-resistant.

8.5 Maximum foot-stop clearance between deck and foot stop

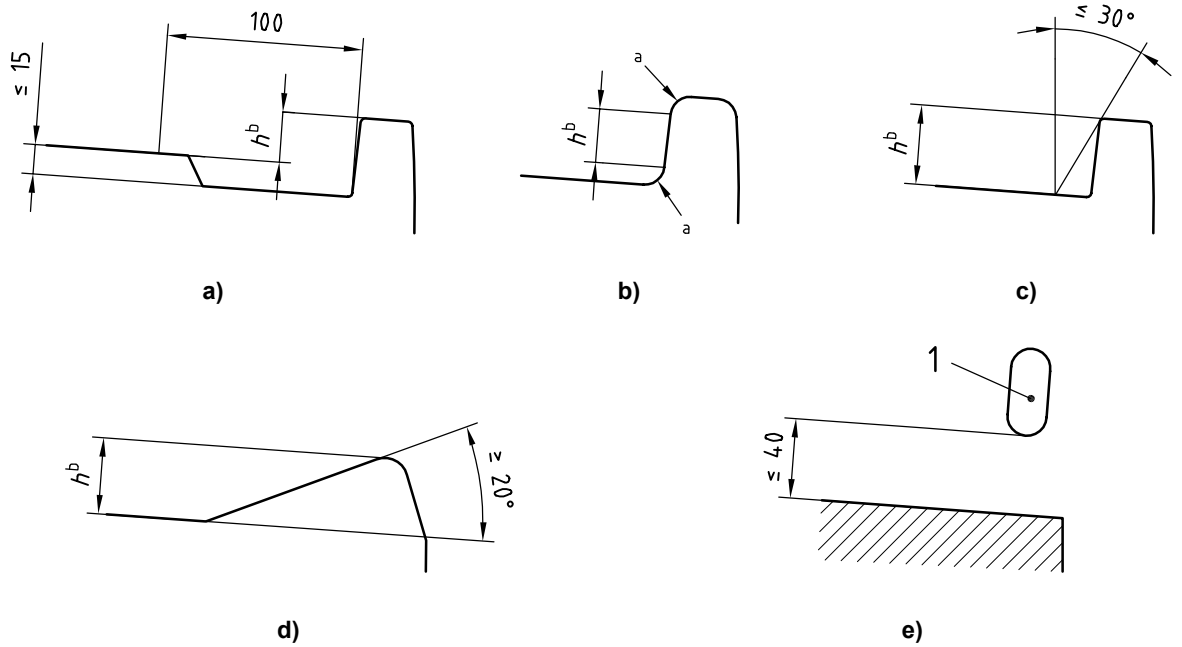
If there is a vertical clearance between deck and foot-stop level the open spaces between the deck level and the bottom of the lowest foot-stopping point shall not be greater than 40 mm [see Figure 2 e)].

EXAMPLE Soft or rigid line parallel to the working deck.

8.6 Continuity on the working deck level in way of the foot-stop

In order to guarantee foot-stopping action there shall be no step in the working deck level greater than 15 mm within 100 mm from the foot-stop [see Figure 2 a)].

Dimensions in millimetres



Key

1 Foot-stop above deck level

a Fillet radius > 5 mm

b h according to 8.3

Figure 2 — Diagram illustrating the requirements of 8.3, 8.4, 8.5 and 8.6

8.7 Gaps in the foot-stop rail

Gaps in the foot-stop rail are allowed for stanchions, pulpit feet, cleats, etc. or for water drainage, but each gap shall not be greater than 100 mm to the edge of the adjacent fitting or foot stop rail. This distance shall be measured parallel to the foot stop general line.

Fittings providing foot-stopping action are considered to be local foot-stops.

EXAMPLE Stanchions, pulpit feet, cleats.

9 Requirements for handholds

9.1 General

When required by clause 6, handholds shall meet the requirements given in 9.2 and 9.3.

9.2 Location in way of side decks

Handholds fitted less than 300 mm inboard from the outer working deck edge shall be placed at least 350 mm above deck level, but not higher than the adjacent superstructure.

Handholds fitted more than 300 mm inboard from the outer working deck edge may be placed at any height.

Figure 3 shows diagrams illustrating this requirement.

NOTE This requirement derives from the fact that, on narrow passageways, it is possible only to pass standing, and therefore, low handholds cannot be reached.

On the route along the outer edges of the working deck, the maximum distance between two adjacent handholds shall not exceed 1,5 m.

9.3 Strength

Handholds, as built and installed, shall be capable of withstanding, without rupture, a horizontal force of 1 500 N. This requirement may be verified by test or calculation.

10 Common requirements for low and high guard-rails and guard-lines

10.1 General

According to the options of clause 6, guard-rails may be required, either low guard-rail/low guard-line ($h \geqslant 450$ mm) or high guard-rail/ high guard-line ($h \geqslant 600$ mm) as specified in 10.2.

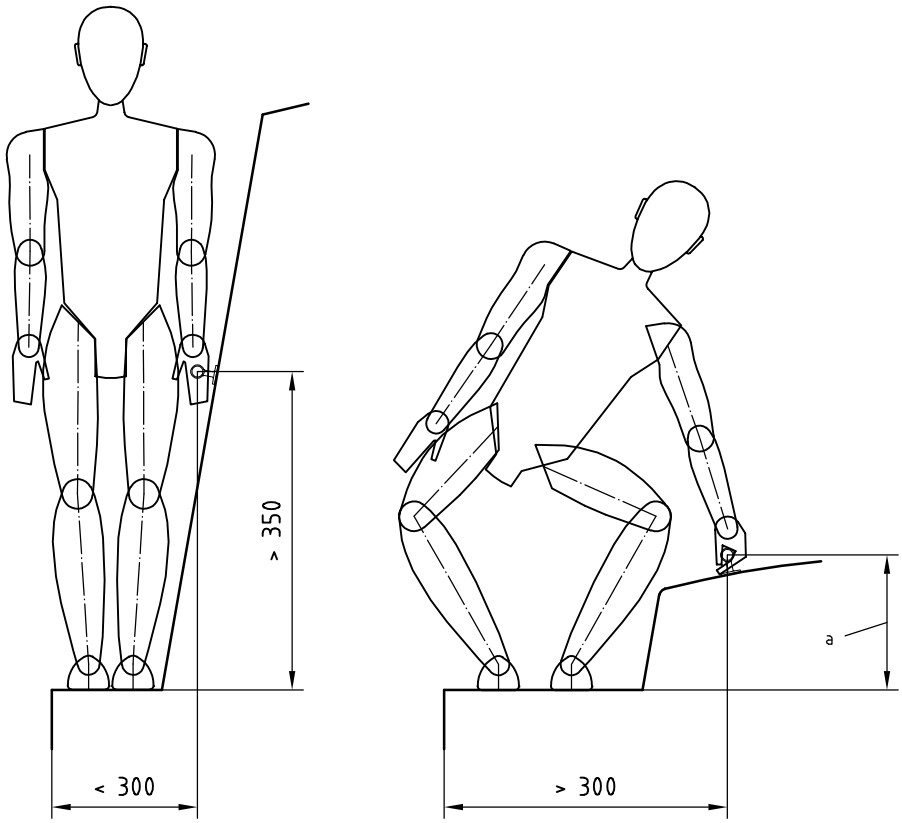
Guard-rails shall completely surround the outer edges of the working deck except in the transversal direction as permitted by 10.3, 10.6 and 10.8.

10.2 Height of guard-rails or guard-lines

Low guard-rails/ low guard-lines shall have a height of at least 450 mm.

High guard-rails/ high guard-lines shall have a height of at least 600 mm.

Dimensions in millimetres



[a] any height

Figure 3 — Diagram illustrating the requirements of 9.2

If there are discontinuities in the working deck level, the vertical gap between the lowest guard-rail/guard-line and the deck or foot-stop, coaming, bulwark, etc., whichever is higher, shall not be greater than

— 560 mm for low guard-rail or low guard-line [see Figure 4 a)];

— 380 mm for the intermediate line of a high guard-rail or guard-line [see Figure 4 b)].

The length of these discontinuities in the main deck area shall not be greater than 600 mm, when measured parallel to the guard-rail/guard-line mean direction [see Figures 4 a) and 4 b)].

10.3 Intermediate lines, vertical spacing and maximum gap

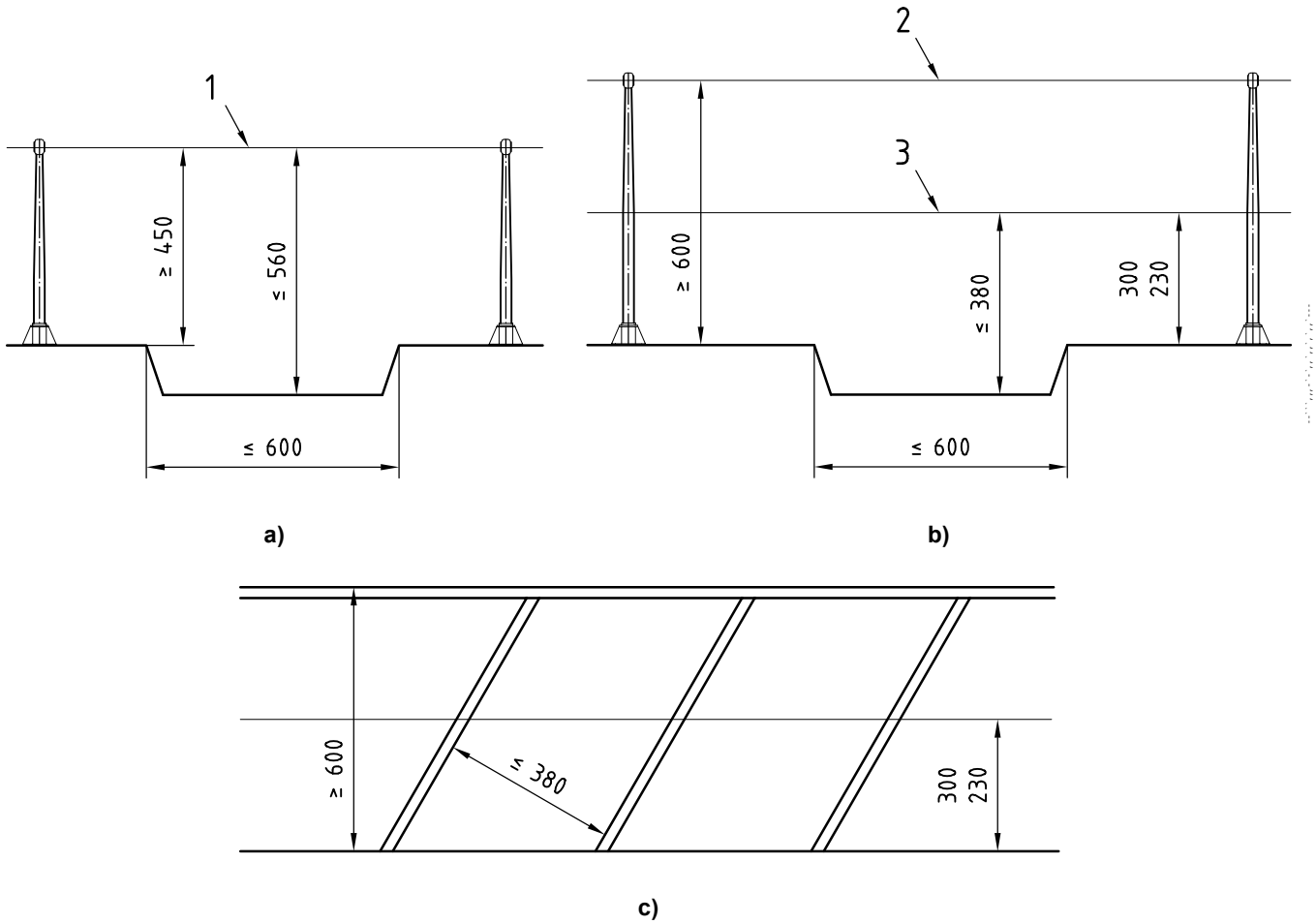
On non-sailing boats, rigid high guard-rails and pulpits need not be fitted with intermediate lines.

If high guard-rail/guard-lines are installed, an intermediate guard-rail shall be fitted, the gap between this intermediate line and the deck, foot, stop, bulwark, etc, whichever is higher, shall not be greater than 300 mm.

As an alternative, the intermediate line may be replaced by any device limiting the gap between two adjacent protections below 380 mm, in any direction [see Figure 4 c)].

EXAMPLE Pulpits having closely spaced feet, tripod pulpits.

Dimensions in millimetres



Key

1 Low guard-line (450 mm)

2 High guard-line (600 mm)

3 Intermediate line

Figure 4 — Diagram illustrating the requirements of 10.2 and 10.3

10.4 Risk of falling overboard from elevated parts

Even when protected from falling overboard by guard-rail/guard-line there is a risk of falling overboard from higher parts of the working deck.

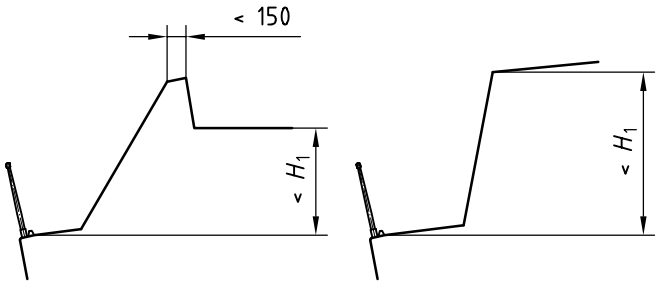
Therefore

— any part of the working deck located higher than H_1 from the adjacent part of the working deck shall at least be equipped with foot-stop according to clause 8;

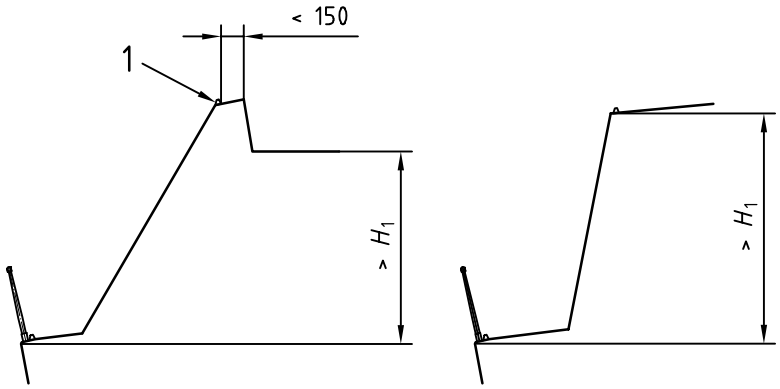
— any part of the working deck located higher than H_2 from the adjacent part of the working deck shall at least be equipped with foot-stop according to clause 8 and guard-rails/guard-lines having the same height as at the outer periphery of the deck.

See Figure 5.

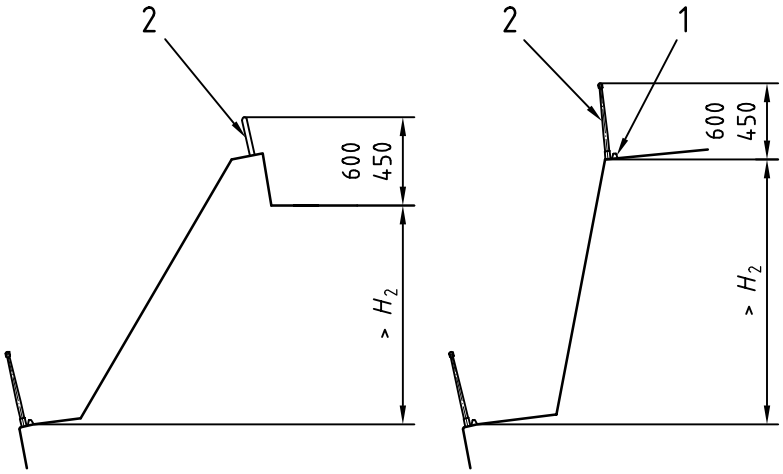
Dimensions in millimetres



a) Actual height $< H_1$**: no specific requirement**



b) Actual height $> H_1$**: foot-stop required**



c) Actual height $> H_2$**: foot-stop and guard-rail/line required**

Key

1 Foot-stop

2 Guard-rail/line

Figure 5 — Diagram illustrating the requirements of 10.4

H_1 and H_2 are function of the height of the guard-rail/guard-line and defined in Table 5.

Table 5 — Values of H_1 and H_2 according to guard-rail/guard-line height

Dimensions in millimetres

Guard-rail/line height	H_1	H_2
450	700	1 200
600	900	1 500

NOTE On flying bridges, the working deck area, defined by the builder, is usually the flying bridge sole.

Only the areas having a horizontal projection perpendicular to the guard-rail/line mean direction greater than 300 mm shall be considered in the upper requirement.

10.5 Openings in guard-rails/guard-lines

To facilitate boarding or reboarding of people or equipment, openings in the guard-rail/guard-lines are allowed, provided that permanently fixed and quickly operable mobile sections are fitted in way of these openings. These sections shall be designed not to open inadvertently.

Openings in guard-rails/guard-lines are also allowed for the passage of sails, provided that there is no gap transversally and that the space between the rails does not exceed 150 mm.

10.6 Bow pulpits for sailing boats

Bow pulpits may be open but the opening between the pulpit and any part of the boat shall never be greater than 360 mm.

This requirement shall be checked by presenting a 360 mm circle inside the opening. Figure 6 illustrates this procedure.

Dimensions in millimetres

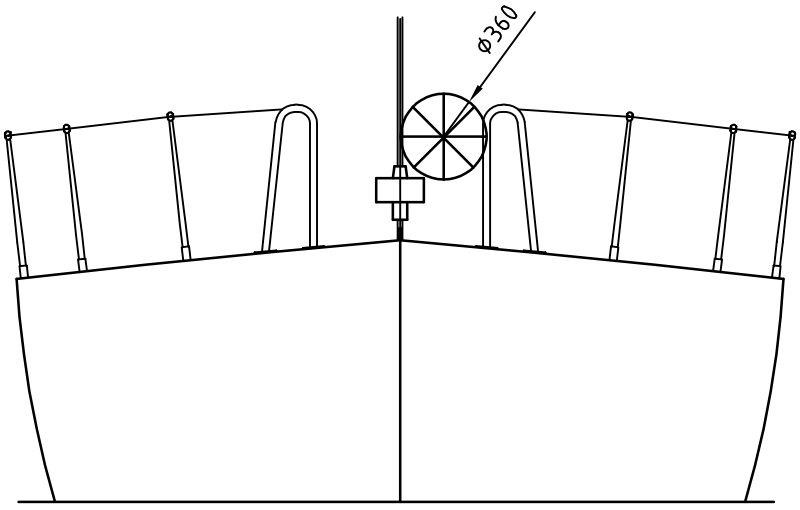


Figure 6 — Diagram illustrating the requirement of 10.6

10.7 Transom guard-rails/guard-lines for sailing boats

10.7.1 On boats where a high guard-rail/guard-line is required:

— the aft pulpits in way of the transom or guard-line support shall have at least the required 600 mm height;

— the transversal line need not meet the requirements of 10.1, 10.2, 10.3 and 12.2.1 provided that

  — the height of the line is at least 450 mm above any part of the seat;

  — the height of the line is at least 800 mm above any part of the cockpit bottom local level;

  — there is a handhold according to clause 9 allowing an athwartship grip line higher than 600 mm not farther than 1 250 mm from the line end;

  — the horizontal distance between two adjacent supports is not greater than 2 500 mm.

See Figure 7.

10.7.2 On boats where a low guard-rail/guard-line is required:

— the aft pulpits in way of the transom or guard-line support shall have at least the required 450 mm height;

— the transversal line need not meet the requirements of 10.1,10.2,10.3 and 12.2.1 provided that

  — the height of the line is at least 300 mm above any part of the seat level;

  — the height of the line is at least 650 mm above any part of the cockpit bottom local level;

  — there is a handhold according to clause 9 allowing an athwartship grip line higher than 600 mm not farther than 1000 mm from the line end;

  — the horizontal distance between two adjacent supports is not greater than 2 000 mm.

See Figure 7.

10.8 Forward cross beams of sailing catamarans

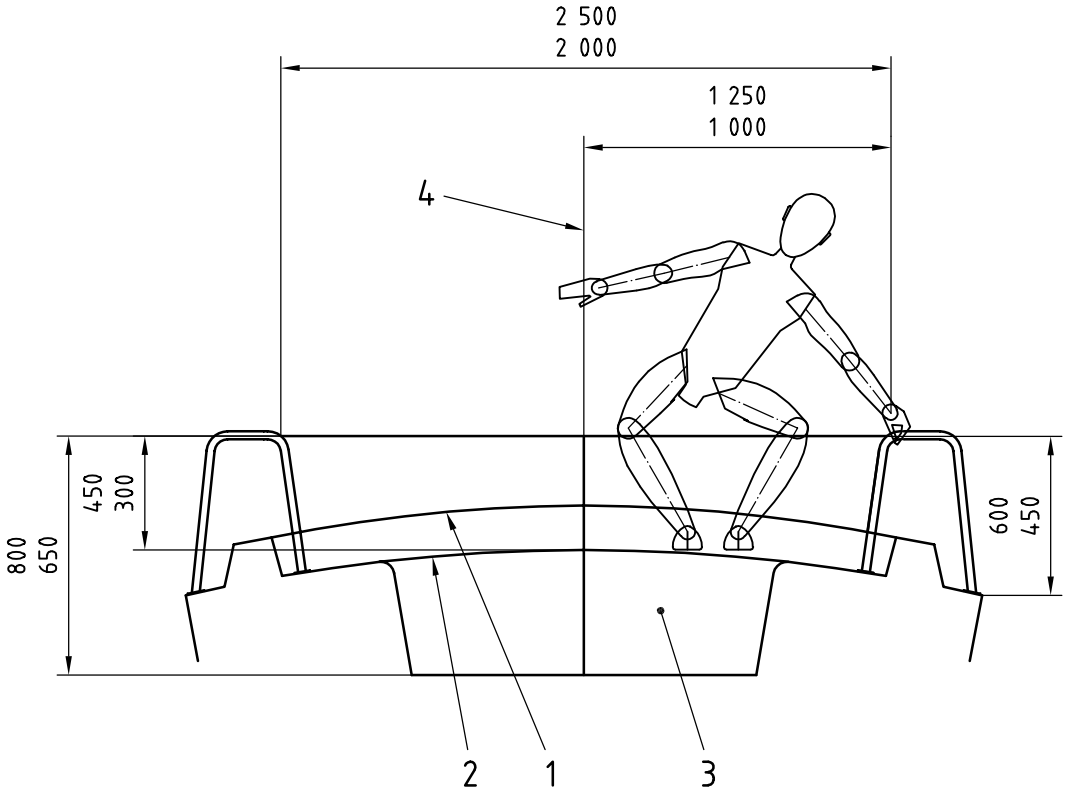
On sailing catamarans, the wire/rod and stanchion bracing on forward cross beam may be regarded as a guard-rail/guard-line, even if its height varies from the minimum required height to zero at the beam end. The minimum height of this wire/rod at centreline shall be according to the option of Table 4 for guard-rail/guard-line height.

Similarly, the height of the longitudinal guard-rail/guard-line system on the outer edges of the hulls may diminish to zero in way of the forward beam. As long as the greatest distance between possible handhold points on the transverse and longitudinal guard-rails shall not be greater than 0,75 m.

10.9 Central hull of sailing trimarans

On sailing trimarans, guard-rails/guard-lines may be omitted on the central hull in the areas where a person falling from the working deck would land on a trampoline, which shall have a width of at least 700 mm in these areas.

Dimensions in millimetres



Key

1 Aft coaming

2 Seat level

3 Cockpit level

4 Handhold (backstay, radar pole, etc.)

Figure 7 — Transom diagram facing aft, illustrating the requirement of 10.7

11 Specific strength requirements for guard-rails or low guard-rails

Guard-rails shall be capable of supporting, at any point of their top, the following outboard forces applied in way of a foot and perpendicularly to the guard-rail local direction, with the corresponding results:

— A horizontal force of 280 N, with a deflection at the force level not greater than 50 mm. This deflection shall be the one of the guard-rail and its supports between their base and top. If there is a clearance between the supports and their base, this deflection shall be measured after the supports are inclined enough to have no residual play. There shall be no permanent deformation of the guard-rail or support after the force has been taken off.

— A horizontal force of 560 N without breaking.

Conformity with these requirements shall be demonstrated by calculation or test. In the latter case the test may be made on the boat or with the guard-rail and its supports placed in a test jig.

12 Specific requirements for guard-lines

12.1 Requirements for high guard-lines, low guard-lines and intermediate guard-lines

The strength of the high guard-lines, low guard-lines and intermediate guard-lines shall fulfil the requirements of Table 6.

If a synthetic line is used it shall be chafe resistant, or protected against chafing, particularly in bearing areas on stanchions and pulpits.

If a periodical inspection or replacement of the synthetic line due to ageing, UV, or chafe, is needed, the period between inspections or maintenance, and the actions to be performed shall be indicated in the owner's manual (see clause 17).

Table 6 — Summary of requirements for high guard-lines, low guard-lines and intermediate guard-lines

Design category	Guard-line minimum ultimate strength N	Approximate[a] 1 × 19 AISI 316 steel wire diameter mm	Approximate[a] 7 × 19 AISI 316 steel wire diameter mm
A	13 000	4	5
B and C	9 000	3,5	4,5
NOTE The diameters given are those of the wire only and do not include any sheathing.			
[a] Means that the resistance of a wire having the indicated diameter shall be checked with the wire manufacturer.			

Guard-lines shall be taut to provide a firm support. Means shall be provided to tension the guard-line.

Any device forming part of the guard-lines shall withstand, as installed, the ultimate loads defined in Table 6. These requirements shall be verified by test or calculation.

12.2 Requirements for stanchions or guard-line supports

12.2.1 Spacing

The spacing between stanchions or guard-line supports shall not be greater than 2,2 m.

12.2.2 Strength

Stanchions or guard-line supports shall be capable of supporting, at their top, the following outboard forces applied perpendicular to the guard-line local direction, with the corresponding results.

— A horizontal force of 280 N with a deflection under load of the stanchion or support not greater than 50 mm at the force level. If there is a clearance between the stanchions and its base, this deflection shall be measured after the stanchion is inclined enough to have no residual play. with no permanent deformation of the stanchion or support after the force has been taken off;

— A horizontal force of 560 N without breaking.

When assessed for the above requirements, the stanchions shall be by themselves, with no lines on.

These requirements may be verified by calculation or test, for at least one sample of the device (stanchion or guard-line support, base, fixture system). In case of test, the deflection and strength need not be measured on the boat, and the stanchion and its support may be tested on a jig.

12.2.3 Fixture and disposition of stanchion and line supports

Stanchions/line supports shall be mechanically secured in their supports. The tension of the guard-lines is not considered to satisfy this requirement.

Guard-lines shall be held vertically and horizontally by the stanchion/line support.

Stanchions/line supports shall not be angled outboard more than 10° from the vertical, at any point above 50 mm from the deck.

13 Requirements for hooking points

13.1 General

Hooking points required by clause 6 shall fulfil the requirements given in 13.2 to 13.4.

13.2 Location

Hooking points shall be located as follows:

a) within 1 m of the edge of the main access hatch/door;

b) within 2 m of all outside steering positions;

c) within 2 m of the mast of sailing boats;

d) within 2 m of the winch positions of sailing boats;

e) within 2 m of the windlass or towing strong point(s).

Hooking points shall be located no more than 3 m apart.

Habitable sailing multihulls of design category A and B shall be fitted with at least one hooking point in the vicinity of each escape hatch, to be used if the boat is in the inverted position.

13.3 Size

In order to allow a correct closing of the harness hook, any hooking point shall be inscribed within a circle of 15 mm diameter.

13.4 Strength

Hooking points shall withstand, a horizontal force of 3 600 N for boats of design category C and 6 000 N for boats of design category A and B. This requirement may be verified by test or calculation. Jack-lines can be attached to hooking points if they have the strength characteristics required in 14.3.

Hooking points need not be specifically designed for this purpose, but shall have the required strength.

EXAMPLE Cleat, pulpit foot stanchion base.

14 Attachment points for jack-lines

14.1 General

Attachment points for jack-lines required by clause 6 shall meet the following requirements.

14.2 Fitting

Attachment points for jack-lines shall be fitted on deck, port and starboard to provide secure fixing for jack-lines. These lines shall be long enough to allow the movements on the working deck needed for boat operation.

Jack-lines may be fitted in sections, but each section of jack-line shall be as long as practicable. Attachment points shall be fitted at the ends of each section.

14.3 Strength

Attachment points for jack-lines shall withstand, a horizontal force of 20 000 N applied in the direction of, and up to an angle of 30° from a line connecting them. This requirement may be verified by test or calculation.

NOTE Attachment points for jack-lines need not be specifically designed for this purpose.

EXAMPLE Cleat, pulpit foot stanchion base.

15 Body support on high-speedboats

15.1 General

High-speedboats of any design category shall be fitted with means of support for each of its occupants~~,~~ when the boat is underway, limiting the risk of being thrown overboard in case of sharp turns, strong acceleration, or movements in the sea.

This requirement only addresses the risk of falling overboard, and not of falling within the limits of the working deck or cockpit.

To provide support, one of the following option shall be chosen, for each person:

— one handhold, as required in clause 9, plus body support as required in 15.2;

— two handholds, as required in clause 9, allowing simultaneous gripping of both hands.

NOTE Two handholds may be any handhold when one can grip two hands separated for at least 200 mm.

15.2 Body support

If the occupants are seated, the body support shall have a height of no less than 120 mm above the rigid bottom of the seat or where a cushion is if fitted, with the cushion fully compressed.

If the occupants are standing or leaning, the body support may only provide support for the back or the torso.

If the occupants are sitting riding astride a seat, i.e. riding, the body support may be provided by the action of the knees.

16 Means of reboarding

The boat shall be provided with a means of reboarding from the water.

EXAMPLE Ladders, steps, handholds, brackets.

If this means is a ladder, the top surface of the lowest step of the reboarding ladder shall be at least 300 mm below waterline, the boat being in minimum sailing condition.

This means of reboarding shall be readily accessible and usable, when in place, without the assistance of anyone on board.

NOTE ”Readily accessible” means capable of being reached quickly, and without the use of tools.

Some boats may not require any specific device to reboard, due to their characteristics.

A boat, in light craft condition according to ISO 8666, with a minimum freeboard smaller than 500 mm, needs only one handhold, suitably located to allow reboarding, with consideration of the boat's stability.

17 Owner's manual

The owner’s manual provided with the boat shall indicate the items specified in Table 7 as required in the relevant clauses and subclauses of this International Standard.

Table 7 — Requirements for owner's manual

Clause or subclause in ISO 15085	Required indication in owner's manual
Subclause 4.1	If appropriate, a text or a sketch in the owner's manual shall indicate the working deck area(s) defined by the boat builder.
Subclause 6.3 and Table 4, option 4	If option 4 is used, a sentence in the owner's manual shall indicate that the boat is only intended for daytime sailing and not at night.
Subclause 12.1	If relevant, Information on maintenance requirements for guard-lines pointing out the need for periodic inspection of synthetic wires for UV degradation and chafe that may necessitate replacement.
Clause 16	Description of the means of reboarding.

Bibliography

[1] ISO 6185 (all parts):2001, *Inflatable boats*

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[4] ISO 13590:1997, *Small craft — Personal watercraft — Construction and system installation requirements*

1) To be published.

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