



SLOVENSKI STANDARD

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SIST EN 14504:2009

Plovila za celinske vode - Plavajoči privezi in pontonski mostovi na celinskih vodah - Zahteve, preskusi

Inland navigation vessels - Floating landing stages and floating bridges on inland waters - Requirements, tests

Fahrzeuge der Binnenschifffahrt - Schwimmende Anlegestellen und schwimmende Anlagen auf Binnengewässern - Anforderungen, Prüfungen

Bateaux de navigation intérieure - Embarcadères flottants et passerelles flottantes sur des eaux intérieures - Exigences, essais

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EUROPEAN STANDARD

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Inland navigation vessels - Floating landing stages and floating equipment on inland waters - Requirements, tests

Bateaux de navigation intérieure - Embarcadères flottants et passerelles flottantes sur des eaux intérieures - Exigences, essais

Fahrzeuge der Binnenschifffahrt - Schwimmende Anlegestellen und schwimmende Anlagen auf Binnengewässern - Anforderungen, Prüfungen

This European Standard was approved by CEN on 25 March 2016.

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EN 14504:2016 (E)**European Foreword**

This document (EN 14504:2016) has been prepared by Technical Committee CEN/TC 15 “Inland navigation vessels”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2017, and conflicting national standards shall be withdrawn at the latest by January 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14504:2009.

The following changes have been made to EN 14504:2009:

- a) Title changed;
- b) Floating civil engineering works subdivided into floating landing stages according to function;
- c) Adaptation of technical requirements to take into consideration the materials used to make floating civil engineering works;
- d) Adaptation of the design situations to take into consideration the function of floating civil engineering works;
- e) Incorporation of metacentre commonly used in shipbuilding as a criteria for assessing floating stability;
- f) Text and drawings have been revised.

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1 Scope

This European Standard specifies safety requirements for floating landing stages and floating systems for passenger transport and their equipment.

Requirements relating to supplies to disposals of berthing vessels are not governed by this Standard.

It is not applicable to:

- floating landing stages for motor vehicle traffic;
- floating landing stages for recreational craft and for vehicles of inland navigation vessels which are not berthing vessels, e.g. floating equipment;
- more severe requirements for floating landing stages used for the transshipment of dangerous goods;
- any landing stages required between vessel and floating landing stage;
- specialised floating structures which are not used for passenger traffic or the berthing of vessels.

2 Normative references

The following documents, which are cited either partially or wholly in this document, are required for the application 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.

EN 711, *Inland navigation vessels — Railings for decks and side decks — Requirements, designs and types*

EN 790, *Inland navigation vessels — Stairs with inclination angles of 45° to 60° — Requirements, types*

EN 1492-4, *Textile slings — Safety — Part 4: Lifting slings for general service made from natural and man-made fibre ropes*

EN 13056, *Inland navigation vessels — Stairs with inclination angles of 30° to < 45° — Requirements, types*

EN 13281, *Inland navigation vessels — Safety requirements for walkways and working places*

EN 13411-2, *Terminations for steel wire ropes — Safety — Part 2: Splicing of eyes for wire rope slings*

EN 13574, *Inland navigation vessels — Permanently installed climbing devices with a length not exceeding 5 m*

EN 14144, *Lifebuoys — Requirements, tests*

EN 14145, *HOLDERS for lifebuoys*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529)*

EN ISO 1140, *Fibre ropes — Polyamide — 3-, 4-, 8- and 12-strand ropes (ISO 1140)*

EN ISO 1346, *Fibre ropes — Polypropylene split film, monofilament and multifilament (PP2) and polypropylene high tenacity multifilament (PP3) — 3-, 4-, 8- and 12-strand ropes (ISO 1346)*

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ISO 8793, *Steel wire ropes — Ferrule-secured eye terminations*

ISO 18421, *Ships and marine technology — Inland navigation vessels — Lifebuoy housings*

ISO 18422, *Ships and marine technology — Inland navigation vessels — Plate with instructions for rescue, resuscitation and first aid for drowning persons*

3 Terms and definitions

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

3.1**floating construction**

a floating structure for passenger traffic on inland waters

3.1.1**floating landing stage**

a floating structure used exclusively for berthing and mooring of vessels and as a connection between vessel and shore

3.1.2**floating equipment**

a floating structure with or without a berth

3.1.2.1**floating landing stage**

floating equipment with a berth, for combined use for passenger traffic, berthing and mooring ships and as a transportation link between the ship and land

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3.1.2.2**floating landing bridge**

floating equipment with no berth, used solely for passenger traffic and not for berthing or mooring ships

3.2**floating body**

one or more fixed buoyancy bodies with a traffic area and/or a connecting bridge support

3.3**buoyancy body**

body capable of floating that either:

- consists of waterproof air chambers or
- is completely filled with a closed-pore material

3.4**connecting bridge**

movable walkway between floating body and shore

3.5**Anchorage for the floating structure**

Device by which the floating structure is secured to its berth

3.6**shore boom**

spacer for floating body

3.7**freeboard**

distance between water level and top of the buoyancy body

3.8**residual freeboard**

distance between the waterline and the upper edge of the buoyancy body in the event of a leak

3.9**safety distance**

distance between water level and lowest point of buoyancy body with air chambers that is no longer watertight

3.10**residual safety distance**

distance between the waterline and the lowest point of a buoyancy body with air chambers that is no longer watertight in the event of a leak

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4 General requirements (standards.iteh.ai)

4.1 Components

The floating structure consists of floating body, connecting bridge and anchorage.

4.2 Strength

The strength of the components of floating structures shall be fixed taking into account the actions described in Annex A.

Test as specified in 7.2.

4.3 Buoyancy and stability**4.3.1 General**

In combination with the following proof of buoyancy and stability, for floating structures the effects in accordance with Annex A shall have a partial safety coefficient of $\gamma_F = 1,0$.

4.3.2 Intact stability

A

- freeboard of at least 0,15 m;
- safety clearance of at least 0,30 m and
- heeling angle of no more than 10°

shall be maintained.

In addition, the metacentric height for floating structures under option A (see 4.4) under impacts as per A.5 to A.7 and A.11 shall be at least 0,15 m. For these structures, heeling motions caused by the vessel's

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movement or by the mooring equipment as well as open areas of liquid, which occur during the operation of the structure, shall also be taken into consideration.

Test as specified in 7.3.1.

4.3.3 Damaged stability

If an air chamber is damaged, the watertight integrity and stability shall be ensured. In this case, a residual freeboard and a residual safety distance each of not less than 10 cm shall be maintained; if greater safety clearances or residual freeboards are required, these shall be taken into account.

Free surfaces of liquids that can occur during operation shall also be taken into account.

If all buoyancy bodies are completely filled with a material according to 4.5.4, proof of leak stability may be omitted.

Test as specified in 7.3.2.

4.4 Anchorages for floating structures

Floating structures shall be anchored in their positions to prevent them from being torn loose or being displaced by currents, wind, waves, fluctuations in water level or the draught or wash of passing vessels or possible special loads. In the case of floating landing stages and floating landing bridges, the influence of berthing ships shall also be taken into consideration. The functioning capability of the anchoring shall also be documented for the case that the floating body of the floating structure springs a leak.

Anchorage for the floating stages shall comply with one of the following two options:

a) Option A:

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The floating stage shall be secured to the land by means of

- 1) Chains, [SIST EN 14504:2016
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- 2) Cables
- 3) Synthetic ropes as per EN ISO 1140 or EN ISO 1346
- 4) A pier anchor of appropriate strength and length or
- 5) the connecting bridge.

The fastenings shall be secured against deliberate undoing. This requirement is considered to be met if it is not possible to undo the fastenings without the use of a tool.

Rope end connections shall be designed as splicers according to EN 13411-2 or by means of aluminium ferrules according to ISO 8793. Plastic rope end connections shall be designed according to EN 1492-4.

b) Option B:

The floating structure shall be attached to guides or dolphins in accordance with 4.5.3.

4.5 Structural requirements**4.5.1 General**

The floating structure shall be designed so that it can follow all changes in water level during operation.

4.5.2 Freeboard

Taking into account 4.3, for floating landing stages and floating landing bridges the freeboard of the floating body shall be selected so that the height difference between the traffic areas of the floating body and the deck of the vessel is as small as possible for the berthing vessels expected.

For floating jetties, the freeboard of the floating body should be selected taking 4.3 into account, so that no waves enter the traffic areas under predictable wind and wave conditions.

4.5.3 Floating bodies

Floating bodies using option B (see 4.4) anchorages shall be fixed so that they cannot tilt. The height of the guides or dolphins shall be measured so that the floating body is not flooded at the maximum water level to be expected or the floating body shall be secured against floating away.

Floating bodies shall have one or more buoyancy bodies, which

- comprise a total of at least three watertight air chambers or
- are completely filled with a material according to 4.5.4.

It shall be possible to seal the openings in the air chambers so that they are waterproof.

4.5.4 Materials for filled buoyancy bodies

Materials used to fill the filled buoyancy body shall have closed pores.

The water absorption characteristics of the material shall be taken into consideration during proving.

For buoyancy elements made of expanded polystyrene according to EN 13163, water absorption characteristics according to EN 12087 of max. 5% by volume are recommended.

These materials shall be protected against external influences or against such influences.

5 Equipment

5.1 Railings, barrier

5.1.1 The walkways on floating landing stages shall be fitted with fixed railings as specified in EN 711 at points where it is possible to fall into the water or to lower-lying levels. Types PF or PG shall be selected for floating landing stages or floating landing bridges used for passenger traffic.

5.1.2 There shall be a barrier at the shore-side access point to the connecting bridge of the floating landing stage if the design of the landing stage does not prevent persons being subjected to any hazards when the vessel is going alongside.

5.1.3 Where a fall into the water or onto lower levels is possible, the traffic areas of floating equipment shall be fitted with Type PF or PG fixed railings according to EN 711. In areas provided for the berthing of ships, the distance between the railings and the outer edge of the floating landing stage shall be at least 0,70 m.

5.2 Life-saving equipment

The floating structures shall have at least one information sign providing information on rescuing, reviving and first aid for a drowning person in accordance with ISO 18422 and at least one lifebuoy every 100 m as specified in EN 14144 with a 30-m long floating line and holder as specified in EN 14145 or housing according to ISO 18421.

EN 14504:2016 (E)**5.3 Device for mooring vessels**

There shall be at least two bollards on the landing stage side of the floating landing stages and floating landing bridges. Each bollard shall withstand a vessel static pull as specified in A.9. The tops of the bollards shall be of anti-slip design and be permanently marked with signal paint.

5.4 Lighting

Lights attached to floating structures may not mislead or hinder shipping through dazzling effects or reflections, nor give rise to confusion with shipping signs or impair their effect.

5.5 Electrical equipment

On the exposed deck, the electrical equipment shall have at least IP55 degree of protection and in moist rooms at least IP44 according to EN 60529.

5.6 Storage spaces

The relevant places for storing loads which can be influenced by lack of stability on the deck of the floating bodies shall be marked, and this shall be taken into consideration and the respective areas marked accordingly.

Suitable devices shall be provided to secure the objects against falling over, slipping or rolling away.

6 Walkways**6.1 General**

Walkways shall meet the requirements of EN 13281.

Floating structures constructed for public traffic shall be suitable for use by people with restricted mobility.

If there are accesses to the air chambers of the floating body, they shall have stairs according to EN 790 or EN 13056 or permanently installed climbing devices as specified in EN 13574.

Unavoidable tripping hazards, such as edges of steps, hatch covers etc. shall be marked with signal paint.

6.2 Connecting bridge

6.2.1 The connecting bridge shall have a minimum clear width of at least 0,90 m and at least 1,50 m for the public passenger traffic.

6.2.2 Nip and shear points shall be covered. The floor covering of connecting bridges shall be provided with additional anti-slip measures in line with the gradient angle.

6.2.3 The floating structures shall be designed so that the gradient of the connecting bridge is as small as possible at mean water level. The maximum inclination angle for connecting bridges shall not exceed 20°; for connecting bridges constructed for public traffic, an inclination angle of 6° shall not be exceeded. Where suitable technical equipment exists, e.g. inclined lifts, stair lifts, these inclination angles need not be adhered to.

6.2.4 Connecting bridges supported on wheels on the shore-side, see Figure A.6, shall be secured against displacement by vessel berthing impact. Spring travel shall not exceed 65 cm. Safety measures shall be taken for spring travel values from 20 cm upwards.

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