



# SLOVENSKI STANDARD

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### Plovila za celinske vode - Plavajoči privezi - Zahteve, preskusi

Inland navigation vessels - Floating landing stages - Requirements, tests

Fahrzeuge der Binnenschifffahrt - Schwimmende Anlegestellen - Anforderungen, Prüfungen

Bateaux de navigation intérieur - Embarcades flottantes - Exigences, essais

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EUROPEAN STANDARD

EN 14504

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EUROPÄISCHE NORM

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## Inland navigation vessels - Floating landing stages - Requirements, tests

Bateaux de navigation intérieure - Embarcadères flottants -  
Exigences, essais

Fahrzeuge der Binnenschifffahrt - Schwimmende  
Anlegestellen - Anforderungen, Prüfungen

This European Standard was approved by CEN on 24 August 2008.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 14504:2009) has been prepared by Technical Committee CEN/TC 15 "Inland navigation vessels", the secretariat of which is held by DIN.

This European Standard EN 14505:2009 including the amendment shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2009, and conflicting national standards shall be withdrawn at the latest by July 2009.

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

This document supersedes EN 14505:2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

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

It is not applicable to:

- bank structures such as quay walls, sheeting walls, piles and dolphins;
- floating landing stages for recreational craft;
- more severe requirements for floating landing stages used for the transshipment of dangerous goods;
- any landing stages required between vessel and floating landing stage.

## 2 Normative references

The following referenced documents are indispensable 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 — Requirements, types*

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

EN 1991-2, *Eurocode 1, Actions on structures — Part 2: Traffic loads on bridges*

EN 1992-2, *Eurocode 2, Design of concrete structures — Part 2: Concrete bridges — Design and detailing rules*

EN 1993-2, *Eurocode 3, Design of steel structures — Part 2: Steel bridges*

EN 1995-2, *Eurocode 5, Design of timber structures - Part 2: Bridges*

EN 13056, *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 13411-5, *Terminations for steel wire ropes — Safety — Part 5: Wire rope grips for eyes*

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 60529:1989)*

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

### 3 Terms and definitions

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

- 3.1 floating landing stage**  
installation used for berthing and mooring of vessels and as a connection between vessel and shore
- 3.2 floating body**  
one or more fixed buoyancy bodies with surface that can be walked on and/or a connecting bridge support
- 3.3 buoyancy body**  
body capable of floating that contains one or more watertight buoyancy cells
- 3.4 connecting bridge**  
movable walkway between floating body and shore
- 3.5 anchorage**  
device by which floating landing stage is secured to its berth
- 3.6 shore boom**  
spacer for floating body
- 3.7 freeboard**  
distance between water level and top of floating body
- 3.8 safety distance**  
distance between water level and lowest point of buoyancy body that is no longer watertight

### 4 General requirements

#### 4.1 Components

The floating landing stage consists of floating body, connecting bridge and anchorage.

#### 4.2 Construction

The requirements applicable to the bridge construction shall be in accordance with EN 1991-2, EN 1992-2 and EN 1995-2.

The manufacturer of floating landing stages shall have available suitable technical staff, experience and relevant equipment.



### 4.3 Strength

The strength of the components of floating landing stages as specified in 4.1 shall be fixed taking into account the actions described in Annex A.

Test as specified in 7.2.

### 4.4 Stability

#### 4.4.1 Intact stability

When proving the intact stability, the actions specified in A.2 to A.4 and A.8 shall have a partial safety coefficient of 1,0. For A.3, the walkways shall be loaded on one side so that heeling of the floating body results. The loads according to A.2, A.4 and A.8 shall be fixed so that the maximum angle of heel results. Heeling moments caused by the vessel static pull or anchorage or free surfaces of liquids that can occur during operation shall also be taken into account. Whenever heeling occurs, both a freeboard and a safety distance each of not less than 30 cm and an angle of heel not greater than 10° shall be maintained.

Test as specified in 7.3.1.

#### 4.4.2 Damaged stability

Floating bodies shall have one or more buoyancy bodies with a total of at least 3 buoyancy cells or closed-cell foam. If a compartment is damaged, the watertight integrity and stability shall be ensured. In the proof of the damaged stability, the actions specified in A.2 shall be taken into account with a partial safety coefficient of 1,0. Free surfaces of liquids that can occur during operation shall also be taken into account. In this case, a freeboard and a safety distance each of not less than 10 cm shall be maintained; if greater safety distances or freeboards are required, these shall be taken into account.

Test as specified in 7.3.2.

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### 4.5 Anchorage

Floating landing stages shall be anchored in their positions to prevent them from being torn loose or being displaced by berthing vessels, currents, wind, waves, fluctuations in water level or the draught or wash of passing vessels:

- a) by the use of chains, ropes or suitably strong and long shore booms or 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 terminations shall be in the form of a splice as specified in EN 13411-2, an aluminium ferrule pressing as specified in ISO 8793 or wire rope grips as specified in EN 13411-5;
- b) to dolphins as described in 4.6.3.

The anchorage shall also be proven if the floating body develops a leak.

### 4.6 Structural requirements

**4.6.1** The floating landing stage shall be designed so that it can follow all changes in water level during operation.

**4.6.2** Taking into account 4.4.2, the freeboard of the floating body shall be selected so that the height difference between the deck of the floating body and the deck of the vessel is as small as possible for the berthing vessels expected.

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**4.6.3** Floating bodies attached to dolphins shall be fixed so that they cannot tilt. The length of the dolphins shall be selected so that the floating body is not flooded at the maximum water level to be expected. If it is not possible to attach the dolphins up to the highest known water level for other reasons, the floating body shall be secured against floating away.

**4.6.4** Openings in the buoyancy bodies shall be spray-water-protected and weatherproof and have a safety distance of at least 50 cm.

**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, PG or PZ shall be selected for floating landing stages used for passenger traffic.

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

**5.2 Life-saving equipment**

The floating landing stage shall have at least one lifebuoy as specified in EN 14144 with a 30 m long floating line and holder as specified in EN 14145 with a sign giving information on rescuing and reviving a drowning person.

**5.3 Device for mooring inland navigation vessels**

There shall be at least two bollards on the water side of the floating landing stage. Each bollard shall withstand a vessel static pull as specified in A.6. The tops of the bollards shall be of anti-slip design and be permanently marked with signal paint.

**5.4 Lighting**

No lights shall be attached to the floating landing stage that would mislead or hinder shipping through dazzling effects or reflections, could 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 IP 22 degree of protection and in moist rooms at least IP 55 according to EN 60529.

**5.6 Storage spaces**

The relevant places for storing materials on the deck of the floating body of floating landing stages shall be marked.

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.

Landing stages constructed for public traffic shall be suitable for use by people with restricted mobility.

If there are accesses to individual compartments 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.

Edges of steps, hatch covers etc. that are unavoidable tripping hazards 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 0,9 m.

**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.

**6.2.3** The floating landing stage 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, the inclination angles quoted in sentence 2 need not be adhered to.

**6.2.4** Connecting bridges supported on wheels on the shore-side, see Figure A.5, 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.

## 7 Testing

### 7.1 Expert

The following tests shall be carried out by an expert for the particular application.

### 7.2 Strength

The strength requirements shall be verified under the conditions specified in annex A.

### 7.3 Stability

#### 7.3.1 Intact stability

Intact stability shall be verified by calculation or by a loading test.

#### 7.3.2 Damaged stability

The damaged stability shall be verified by calculation; in this case, one compartment of the floating landing stage shall be considered to be damaged.