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Oprema za plavalne bazene - 1. del: Splošne varnostne zahteve in preskusne metode

Swimming pool equipment - Part 1: General safety requirements and test methods

Schwimmbadgeräte - Teil 1: Allgemeine sicherheitstechnische Anforderungen und Prüfverfahren

Equipement de piscine - Partie 1: Exigences générales de sécurité et méthodes d'essai

Ta slovenski standard je istoveten z: prEN 13451-1

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Swimming pool equipment - Part 1: General safety requirements and test methods

Équipement de piscine - Partie 1: Exigences générales de
sécurité et méthodes d'essai

Schwimmbadgeräte - Teil 1: Allgemeine
sicherheitstechnische Anforderungen und Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 136.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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Foreword

This document (prEN 13451-1:2009) has been prepared by Technical Committee CEN/TC 136 "Sports, playground and other recreational facilities and equipment", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13451-3:2001.

The European Standard EN 13451 "Swimming pool equipment" consists of

- *Part 1: General safety requirements and test methods*
- *Part 2: Additional specific safety requirements and test methods for ladders, stepladders and handle bends*
- *Part 3: Additional specific safety requirements and test methods for equipment for water treatment purposes*
- *Part 4: Additional specific safety requirements and test methods for starting platforms*
- *Part 5: Additional specific safety requirements and test methods for lane lines*
- *Part 6: Additional specific safety requirements and test methods for turning boards*
- *Part 7: Additional specific safety requirements and test methods for water polo goals*
- *Part 8: Additional specific safety requirements and test methods for leisure water features*
- *Part 10: Additional specific safety requirements and test methods for diving platforms, diving springboards and associated equipment*
- *Part 11: Additional specific safety requirements and test methods for moveable pool floors and moveable bulkheads*

This standard may also be applicable to other equipment not specified, provided the safety requirements are fulfilled.

There may be additional requirements for purposes such as competition swimming and advice should be sought from the governing body of the sport in question.

The Annexes A to H are normative. The Annex I is informative.

In relation to EN 13451-1:2001 the following main amendments have been made:

- a) scope modified in accordance to the EN 15288;
- b) requirements for "use of selected materials" (5.1.2) added;
- c) requirements for "barriers" (5.3) added;
- d) requirements for suction deleted;

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- e) requirements for "entrapment, crushing and shearing points" (5.7) added;
- f) requirements for the "test report" (6.2) modified;
- g) values of "total vertical user load" (Table A.1) modified;
- h) only two test probes for the test methods of head and neck entrapment (Annex D)
- i) normative Annex F "Alternate method for the determination of resistance to slipping" added;
- j) normative Annex G "Use of stainless steel " added;
- k) normative Annex H "Entrapment of hair in slits" added;
- l) informative Annex I "Artificial climate testing conditions for plastic components" added.

1 Scope

This standard specifies general safety requirements and test methods for equipment used in classified swimming pools as specified in EN 15288.

Where specific standards exist, this general standard shall not be used alone.

Special care is required in applying this general standard alone to equipment for which no product specific standard has yet been published.

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 1176-1:2008, *Playground equipment — Part 1: General safety requirements and test methods*

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 15288-1:2008, *Swimming pools — Part 2: Safety requirements for design*

ENV 1991-1, *Eurocode — Basis of structural design*

ISO 5905, *Gymnastic equipment. Landing mats*

ISO 5906, *Gymnastic equipment; Surfaces for floor exercises; Mats*

ISO 5907, *Gymnastic equipment; Surfaces for floor exercises; Boards*

3 Terms and definitions

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

3.1

pool/swimming pool

facility, with one or more water areas, intended for swimming, leisure or other water based physical activities

[EN 15288-1:2008, definition 3.1]

3.2

Swimming pool equipment

components installed in and around a basin, designated:

- to operate the basin and its functionally adjoining areas;
- to use it and its functionally adjoining areas.

NOTE These components can be part of the swimming pool technology, (e. g. water inlets or outlets), to assist the users (e. g. ladders), or for competitive and training use (e. g. starting platforms), or for leisure (e. g. fountains).

3.3

crushing point

place where parts of the equipment can move against each other, or against a fixed area so that persons, or parts of their body, can be crushed

[EN 1176-1:2008, definition 3.10]

3.4

shearing point

place where part of the equipment can move past a fixed or other moving part, or past a fixed area so that persons, or parts of their body, can be cut

[EN 1176-1:2008, definition 3.11]

3.5

grip

holding of the hand around the entire circumference of a support (see Figure 1)

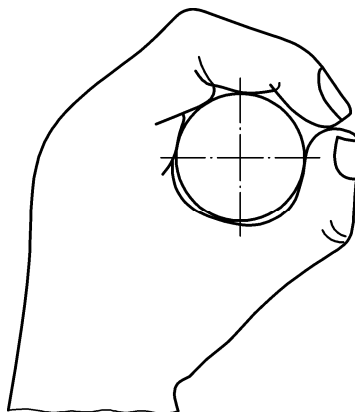


Figure 1 — Grip

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[EN 1176-1:2008, definition 3.15]

3.6

grasp

holding of the hand around part of the circumference of a support (see Figure 2).

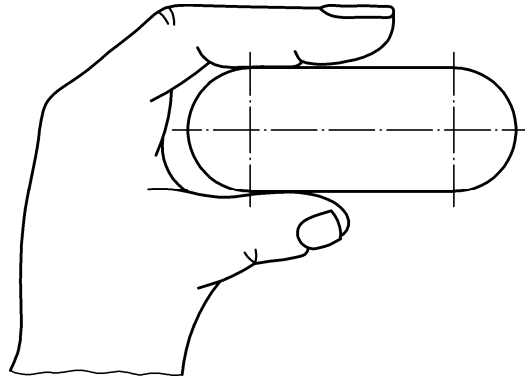


Figure 2 — Grasp

[EN 1176-1:2008, definition 3.16]

3.7

finger hold

holding which is found with hand, at least with the finger head by hooking in

3.8

entrapment

hazard presented by the situation in which a body, or part of a body, the hair or clothing can become trapped

[EN 1176-1:2008, definition 3.17]

3.9

edge

line being formed by two surfaces of something solid which meet one another

3.10

corner

point being formed by two or more edges which meet one another

3.11

minimum space

smallest space required for the safe installation and use of the equipment

3.12

minimum zone for use

minimum space required for anyone who may come into contact with equipment

3.13

protrusion

object, or a portion of an object, that stands or protrudes in/into the minimum zone for use

3.14

handrail

rail intended to assist the user to balance

[EN 1176-1:2008, definition 3.21]

3.15

barrier

means of segregation to prevent movement or access

3.16

safety barrier

barrier designed to prevent users from falling over, through or beneath

3.17

slits

small openings < 8 mm, where entrapment is possible, which may cause into a risk of drowning

3.18

grid

component to cover an overflow channel or an opening, designed to allow the passage of water

4 Safety requirements

4.1 Structural integrity

4.1.1 General

Structural integrity, including stability, of the equipment shall be assessed by one of the following:

- a) calculation, carried out in accordance with Annex A and Annex B;
- b) physical testing, in accordance with Annex C; or
- c) a combination of a) and b).

When calculations are carried out in accordance with Annex B, no limit states shall be exceeded at combinations of loads as given in B.2.

When tested in accordance with Annex C, the equipment shall not show any cracks or damage. Deformation shall remain within the elastic field.

In some cases, these specific calculations or tests are not appropriate but the structural integrity shall be at least equivalent.

Each structure shall resist both the permanent and variable loads acting on equipment and parts of equipment as described in Annex C.

No allowance for accidental loads, i.e. loads produced by fire, collision by vehicles or earthquake has to be made for swimming pool equipment.

The loads associated with fatigue are much smaller than the loads in combination with the appropriate load factors when calculated according to B.2. Therefore swimming pool equipment needs not to be verified for fatigue.

Structural parts shall resist the worst case loading condition.

If a piece of equipment is made by components, it has to be constructed in such a way that every component is secured in its working position.

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4.1.2 Use of selected materials

4.1.2.1 Use of stainless steel

The use of stainless steel with safety critical load bearing function in the swimming hall atmosphere which could be subjected to stress corrosion shall be avoided, unless it can be inspected and regularly cleaned. Where stainless steel is used the grade used should be recommended for that case (see Annex G).

4.1.2.2 Use of plastic materials

Where ever the risk assessment identifies possible hazards for users in case of progressive degradation of plastic components, appropriate actions shall be taken (e. g. stating a maximum life span, necessity of periodical inspection).

Where ever the design risk assessment identifies the possibility of fracture or failure due to degradation it shall be subject to continuing risk assessment.

NOTE If failure can be caused by the environmental conditions, then tests should be carried on complying with Annex G.

4.2 Minimum space

The manufacturer/supplier shall indicate the minimum space needed for the installation, operation and use of their equipment.

4.3 Handrails, barriers, safety barriers

4.3.1 Handrails

Handrails for general use shall be not less than 800 mm and not more than 1100 mm above the foot position. Handrails destined to children only shall be not less than 600 mm and not more than 850 mm above the foot position.

4.3.2 Barriers

The design of the barriers shall not encourage the users to stand or sit on them and shall prevent climbing.

Barriers may be in form of gratings, full faced panels or walls.

NOTE The design should consider the visual needs connected with the use of the facility.

4.3.3 Safety barriers

Safety barriers shall be used to prevent users falling from heights > 600 mm.

They shall have gaps maximum 100 mm (+2 mm) and where two or more safety barriers are used in combination (e. g. ladder, stair and platform) the safety barrier shall be continuous throughout.

Barriers shall have a height $\geq 1\ 000$ mm, measured from the highest point on which a person can stand within 1 000 mm from the barriers themselves, see Figure 3.

Dimensions in millimetres

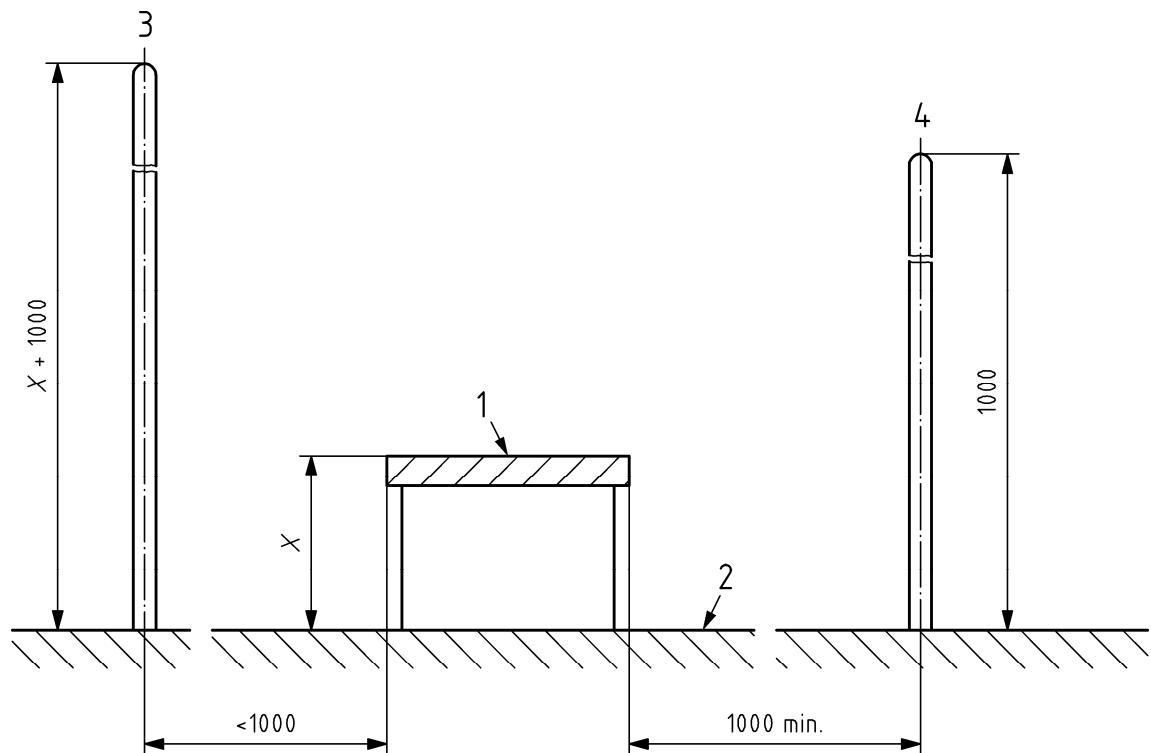


Figure 3 — Height of the safety barriers

Key

- 1 Highest standing point
- 2 Platform
- 3 Barrier within 1 000 mm from a higher standpoint
- 4 Barrier outside 1 000 mm from a higher standpoint
- 3, 4 are different possibilities for placing barriers
- X Height of highest point on which a person can stand

4.3.4 Grip

The cross section of any component designed to be gripped shall have in any direction, when measured across its centre, a dimension not less than 16 mm and not more than 50 mm.

4.3.5 Grasp

The thickness of any component designed to be grasped shall have a width not exceeding 60 mm.

4.3.6 Finger hold

The minimum space for clutching shall be 15 mm high and 20 mm wide. For an example see Figure 4.

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EXAMPLE

Dimensions in millimetres

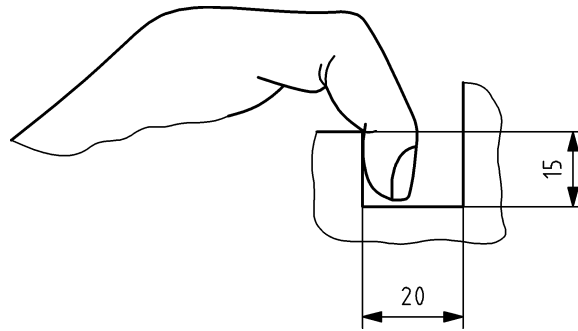


Figure 4 — Finger hold

4.4 Surfaces

4.4.1 Surface finishing

The surface finishing in the minimum zone for use shall not present any risk of injury. Special attention shall be paid to

- the finishing of welds;
- the risk of splintering.

4.4.2 Surface materials

The materials in contact with the water shall have no detrimental effects on its quality and shall be fit for their purposes.

4.5 Protrusions

NOTE Protrusions are a hazard of impact or entrapment especially where water movement can cause involuntary movement of users.

Protrusions with a height $h \leq 3$ mm, not shielded by adjacent areas, as shown in Figure 5a), shall be rounded with a radius $R > h/2$ or chamfered in accordance with Figure 5b).

Protrusions with a height $h > 3$ mm to ≤ 15 mm, not shielded by adjacent areas, as shown in Figure 5a), shall be rounded with a radius $R = \leq 3$ mm. See Figure 5c).

Protrusions with a height $h > 15$ mm, not shielded by adjacent areas or additional measures (e. g. handles for counter-flow plants), for the first 15 mm of projection shall be radiused as stated in the previous paragraph, and for the remaining projection shall have a maximum inclination of 45° , tangentially connected. See Figure 5d).