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**Oprema za plavalne bazene - 3. del: Dodatne posebne varnostne zahteve in preskusne metode za bazenski pribor za pripravo vode**

Swimming pool equipment - Part 3: Additional specific safety requirements and test methods for inlets and outlets and water/air based water leisure features

Schwimmbadgeräte - Teil 3: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für Flansche und Auslässe

Equipement de piscine - Partie 3: Exigences de sécurité et méthodes d'essai complémentaires spécifiques pour les pièces d'aspiration et de refoulement et d'équipement de loisirs aquatiques

**Ta slovenski standard je istoveten z: prEN 13451-3**

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## Swimming pool equipment - Part 3: Additional specific safety requirements and test methods for inlets and outlets and water/air based water leisure features

Équipement de piscine - Partie 3: Exigences de sécurité et méthodes d'essai complémentaires spécifiques pour les pièces d'aspiration et de refoulement et d'équipement de loisirs aquatiques

Schwimmbadgeräte - Teil 3: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für Flansche und Auslässe

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

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## Foreword

This document (prEN 13451-3:2009) 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*

In relation to EN 13451-3:2001 the following main amendments have been made:

- a) Requirements of EN 13451-8:2001 were incorporated;
- b) Requirements of the hair entrapment tests were changed.

## 1 Scope

This part of EN 13451 specifies safety requirements and test methods for inlets and outlets and water/air based water leisure features involving water movement, in addition to the general safety requirements of prEN 13451-1:2009.

The requirements of this specific standard take priority over those in prEN 13451-1:2009

This part of EN 13451 is applicable to:

- swimming pool equipment designed for

## prEN 13451-3:2009 (E)

- the introduction and/or extraction of water for treatment or leisure purposes
- the introduction of air for leisure purposes
- water leisure features involving the movement of water

NOTE The above items are identified with the general term fittings.

## 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 1069-1, *Water slides of 2 m height and more — Part 1: Safety requirements and test methods*

prEN 13451-1:2009, *Swimming pool equipment — Part 1: General safety requirements and test methods*

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

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

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13451-1:2009 and the following apply.

### 3.1 floor/wall inlet

device designed to be installed into the pool floor/wall for introducing water/air

### 3.2 floor water outlet

device designed to be installed into the pool floor, for the extraction of water, by gravity or by suction

NOTE When used to drain/to empty a pool floor, water outlets are named bottom drains.

### 3.3 wall water outlet

device designed to be installed into the pool wall for the extraction of water, by gravity or by suction

### 3.4 sump

vessel between the suction outlet grille and the suction outlet piping, manufactured or field built

### 3.5 skimmer

device built into the pool wall, designed to skim the uppermost layer of water only and return it to the filtration system

### 3.6 overflow channel

channel to take in the overflowing water of the related basin, as part of the filtration circuit

NOTE An overflow channel could be located e. g.

- at deck level;
- built into the basin wall.

### **3.7 grille**

component to cover any opening, designed to allow the passage of water and/or air

EXAMPLE A grille could be an inlet grille, an outlet grille, an overflow channel grille, a deck level channel grille.

### **3.8 cover**

protection device or assembly that separates the user from hazards caused by an opening

### **3.9 water speed**

water flow through velocity in the open cross section of an opening

### **3.10 air speed**

air flow through velocity in the open cross section of an opening

### **3.11 open cross section of a grille**

open section of a grille through which the corresponding flow rate can flow by design. It is the sum of the single open sections of the grille

### **3.12 water operated leisure feature**

feature formed as a result of water, being emitted either into or from a swimming pool

EXAMPLE Waves, water cannons, rain sprays, waterfalls, mushrooms and rapid rivers.

### **3.13 air operated leisure feature**

feature formed as a result of air, being emitted into swimming pool water

EXAMPLE Geysers and bubble seats.

### **3.14 air and water operated leisure feature**

feature formed as a result of air and water, being emitted into or from a swimming pool

EXAMPLE Hydromassages.

### **3.15 integrated swim jet system**

integrated fitting that incorporates a suction outlet and an inlet in a single housing that is designed to move a large volume of water at high velocity in a single direction

### **3.16 gravity feed tank**

tank that is filled by pool water flowing by gravity only, intended as a separation element between the pool and the suction pumps

**prEN 13451-3:2009 (E)****4 Safety requirements****4.1 General**

As the components defined in Clause 3 are integral parts of an overall system, special attention shall be paid to the system design criteria, especially taking into consideration the interaction between different components.

Where leisure water features are created by the introduction of air and/or water under pressure into the pool water, the safety of the users shall be provided by means of a risk assessment according to EN 15288-1:2008 and EN 15288-2:2008, including their design, location, method of operation, warning signals and supervision.

**4.2 Structural integrity****4.2.1 Floor inlets**

Floor inlets shall be tested for:

- vertical load, according to 5.2.2;
- horizontal load and deformation, if applicable, according to 5.2.3;
- point load according to 5.2.4;
- shear load, if applicable according to 5.2.5.

**4.2.2 Wall inlets**

Wall inlets installed between water level and 800 mm depth shall be designed to withstand a load equivalent to 100 % of the load stated in A.2.2 of prEN 13451-1:2009.

Wall inlets installed > 800 mm below water level shall be designed to withstand a load equivalent to 10 % of the load stated in A.2.2 of prEN 13451-1:2009.

Wall inlets shall be tested for:

- horizontal load and deformation, if applicable, according to 5.2.3;
- point load according to 5.2.4;
- shear load, if applicable, according to 5.2.5.

**4.2.3 Floor and wall water outlets**

Floor water outlets shall be designed to withstand the load stated in A.2.2 of prEN 13451-1:2009.

Floor water outlets shall be tested for:

- vertical load, according to 5.2.2;
- horizontal load and deformation, if applicable, according to 5.2.3;
- point load according to 5.2.4;
- shear load, if applicable, according to 5.2.5;



- vacuum and point Impact according to 5.2.6;
- hair entrapment in accordance with 5.3.

#### 4.2.4 Skimmer top covers

The upper part of the skimmers, if placed in a walkable area, shall be designed to withstand the load stated in A.2.2 of prEN 13451-1:2009.

Skimmer top covers shall be tested for vertical load, as stated in 2.

#### 4.2.5 Grilles

##### 4.2.5.1 General

Grilles and their substructure shall be designed to withstand the load stated in A.2.2 of prEN 13451-1:2009, related to their shape (point, line or area load).

Grilles shall be tested for vertical load, in accordance with 5.2.2.

In case of manufactured substructures (e.g. overflow channel) also the complete assembly of grill and substructure shall be tested for vertical load in accordance with 5.2.2.

##### 4.2.5.2 Grilles for overflow channels

Grilles made up from separate elements shall remain interconnected under conditions of use.

Grilles shall be designed to remain in position and to prevent their movement when subject to normal conditions of use.

##### 4.2.6 Skimmer weir

As the floating weir, is an essential component for skimming the uppermost layer of the water only, it shall be always properly working. It shall be removable only by intentional manoeuvre or with the use of tools.

##### 4.2.7 Skimmer top covers

If the upper part of the skimmers is placed in a walkable area, it shall be designed to withstand the load stated in A.2.2 of prEN 13451-1:2009.

Lids shall be removable only by intentional manoeuvre or with the use of tools.

##### 4.2.8 Overflow channels

When the overflow channel is designed to be covered by a grille, its supporting structure shall withstand the same load as the grille itself.

They shall pass the load test in accordance with 5.2.1.

#### 4.3 Water speed at inlets

The water speed at inlets shall be  $\leq 15$  m/s, except for injection from the swimming pool floor in water depth  $< 700$  mm, where it is restricted  $\leq 2$  m/s.

NOTE Typical values of water speed could be:

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- circulation for water treatment purposes:  $\leq 4$  m/s;
- hydromassages and swim jets:  $\leq 15$  m/s;
- cannons:  $\leq 15$  m/s.

For water speed test see 5.3.

**4.4 Air speed at inlets**

The air speed at inlets shall be  $\leq 20$  m/s.

**4.5 Hair entrapment**

Wall water outlets and floor water outlets shall pass the hair entrapment test in accordance with 5.3.

**4.6 Slip resistance of grilles**

Slip resistance of any walkable grilles shall comply with the requirements of prEN 13451-1:2009, Table 1.

**4.7 Risk of suction entrapment****4.7.1 General**

Suction fittings shall be designed and installed so as to reduce the potential for body entrapment.

As a general requirement, water speed at outlets shall be  $\leq 0,5$  m/s.

Additionally at least one of the following requirements shall be met:

- a) multiple suction outlet system designed in such a way that:
  - a minimum of two functioning suction outlets per pump shall be installed;
  - the distance between the nearest points of the perimeters of the fittings is  $\geq 2$  m;
- b) if anyone of the suction outlets becomes blocked, the flow through the remaining suction outlet/s shall accommodate 100 % of the flow rate:
  - grilles which can not be completely covered by one user e. g.;
  - raised grilles domed opposite to the flow direction, with prevalent periferic suction. The height of the dome shall be at least 10 % of the main dimension. Possible obstruction test, see Annex A;
  - single grilles with a surface of the area circumscribed to the suction openings  $\geq 1$  m<sup>2</sup> (see Figure 1).