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**Oprema za plavalne bazene - 11. del: Dodatne posebne varnostne zahteve in preskusne metode za premične bazenske pode in premične pregrade**

Swimming pool equipment - Part 11: Additional specific safety requirements and test methods for movable pool floors and movable bulkheads

Schwimmbadgeräte - Teil 11: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für höhenverstellbare Zwischenböden und bewegliche Beckenabtrennungen

Equipement de piscine - Partie 11: Exigences de sécurité et méthodes d'essai complémentaires propres aux fonds de bassins mobiles et cloisons mobiles

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## Swimming pool equipment - Part 11: Additional specific safety requirements and test methods for movable pool floors and movable bulkheads

Équipement de piscine - Partie 11: Exigences de sécurité et méthodes d'essai complémentaires propres aux fonds de bassins mobiles et cloisons mobiles

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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 13451-11:2012) has been prepared by Technical Committee CEN/TC 136 "Sports, playground and other recreational equipment", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13451-11:2004.

In relation to EN 13451-11:2004, the following main amendments have been made:

- a) normative references have been updated;
- b) requirements for the recessed ledges and steps have been modified;
- c) safety requirements for the prevention of interference with the circulation system have been added;
- d) width of the walkable area behind the starting platform has been changed;
- e) test procedure for rigid closure devices has been modified.

EN 13451 "Swimming pool equipment" consists of the following parts:

- *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 inlets and outlets and water/air based water leisure features;*
- *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 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.*

## prEN 13451-11:2012 (E)

### 1 Scope

This part of EN 13451 specifies safety requirements for moveable pool floors and moveable bulkheads in addition to the general safety requirements of EN 13451-1 and should be read in conjunction with it.

The requirements of this part of EN 13451 take priority over those in EN 13451-1.

This part of EN 13451 is applicable to manufactured moveable pool floors and moveable bulkheads for use in classified swimming pools as specified in EN 15288-1 and EN 15288-2.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13451-1:2011, *Swimming pool equipment — Part 1: General safety requirements and test methods*

EN 13451-4:2001, *Swimming pool equipment — Part 4: Additional specific safety requirements and test methods for starting platforms*

EN 13451-5:2001, *Swimming pool equipment — Part 5: Additional specific safety requirements and test methods for lane lines*

EN 13451-10, *Swimming pool equipment — Part 10: Additional specific safety requirements and test methods for diving platforms, diving springboards and associated equipment*

EN ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100)*

EN ISO 13850, *Safety of machinery — Emergency stop — Principles for design (ISO 13850)*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857)*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13451-1:2011 and the following apply.

#### 3.1

##### **moveable pool floor**

adjustable floor designed to change the water depth of the pool

#### 3.2

##### **open side of a moveable pool floor**

open side of a moveable floor not moving alongside a pool wall

#### 3.3

##### **water depth**

usable depth measured between water surface and the upper surface of a moveable floor

#### 3.4

##### **moveable bulkhead**

moveable structure, providing a solid partition to divide a pool into sections

## 4 Classification

For the classification see Table 1.

**Table 1 — Classification**

	<b>Movable pool floors</b>	<b>Movable bulkheads</b>
<b>Type 1</b>	Moveable floors bearing live loads by buoyancy only.	Bulkhead bearing live loads by buoyancy only
<b>Type 2</b>	Moveable floors bearing live loads by drive systems supported by the pool structure.	Moveable bulkheads supported by the pool structure.

## 5 Safety requirements

### 5.1 Moveable pool floors

#### 5.1.1 General

Moveable pool floors which fall under Directive 2006/42/EC [1] on Safety of Machinery shall also comply with EN ISO 12100, EN ISO 13850 and EN ISO 13857.

The gradient of a moveable floor in water depth  $\leq 1\,350$  mm in shall be  $\leq 6,6$  %.

The moveable pool floor design shall ensure the effectiveness of the water treatment system.

NOTE 1 In presence of a moveable pool floor, the pool water treatment system should be specifically designed considering possible changes in designation (e.g. a swimmers pool used as non-swimmers pool). A dye test to check the correct water distribution of the complete installation, with the moveable floor in the lowest working position, is advisable. As moveable floor influences the water distribution the result of the dye test has to be evaluated in a different way (see EN 15288-2:2008, Annex A).

NOTE 2 It may be necessary to tighten the construction tolerances of the structure and finishes within the pool basin in order to meet the tolerances set out within this European Standard.

Moveable floors shall allow inspection, cleaning and maintenance of the area underneath.

#### 5.1.2 Structural integrity

The structural integrity of moveable floors shall be verified using the following independently assessed criteria:

- a vertical area load of  $600\text{ N/m}^2$ , evenly applied;
- a concentrated vertical area load of  $2\,000\text{ N/m}^2$  over a square area of  $1\text{ m}^2$  at any point;
- a concentrated vertical area load of  $2\,000\text{ N/m}^2$  over an area of  $2\text{ m} \times 2\text{ m}$  focused in front of the means of exit or similar areas.

NOTE The above values are valid only for use in swimming and associated activities. Different kind of uses (e.g. as a stage, a dancing floor, etc.) may require the use of different loads.

**prEN 13451-11:2012 (E)****5.1.3 Inadvertent movements**

Movements of a moveable floor different from those foreseen by design shall be prevented.

The risks coming from small foreseeable movements (partial submersion or flexion caused by vertical area load, and so on) during use and maintenance in water shall be prevented.

NOTE The requirement can be complied with e.g. by design, securing systems, etc.

**5.1.4 Prevention of entrapment**

Gaps on the surface of a moveable floor shall be  $\leq 8$  mm in one direction.

The gap between the rigid part of a moveable floor and the pool shall be  $\leq 50$  mm in one direction. When the gap is greater than 8 mm, devices, designed to close to variations of the width shall be used.

EXAMPLE Flexible lips, rubber gaskets etc. can be used.

In the case of recessed ladders, the moveable floor's working positions should abut against the vertical surface of the recessed ledges/steps.

These closure devices shall pass the test defined in 6.2.

**5.1.5 Slip resistance**

When the water depth is  $\leq 1\,350$  mm the slip resistance of the walkable area of a moveable floor shall comply with rating group 18° according to EN 13451-1:2011, Table 1.

**5.1.6 Prevention of falling off**

When a moveable floor has an open end, the hazards connected with falling off this end shall be prevented:

- by the use of a moveable bulkhead, located at least at the water surface, to enclose the area of the moveable floor (preferred);
- by the use of a highly visible floating line, conforming to EN 13451-5, installed over the moveable floor surface, 1 m in front of the floor open end. Furthermore, the area 100 mm wide from the open end of the moveable floor edge shall be distinguishable by a contrasting colour.

NOTE It could be advisable to increase the antiskid characteristics of the area 1 m wide from the moveable floor edge, or to change the floor finishing in the same area (e.g. tactile warning).

If a moveable bulkhead is used to enclose the area of a moveable floor, a suitable interlocking system shall be installed to ensure that both components are set in their proper positions before it is open to use.

**5.1.7 Prevention of swimming underneath**

When a moveable floor has an open end, there shall be no access for the users to the area underneath, by the use of

- a bulkhead positioned at the open side of the moveable floor,
- a self-acting tamper proof protection against swimming underneath closing the area between the pool bottom and the moveable floor in all working positions of the moveable floor,

NOTE When a moveable floor is equipped with a self-acting tamper proof protection and the adjacent pool wall has a recessed safety ledge:



- the recessed safety ledge should be closed at every position where the closing protection crosses the safety ledge to avoid entrapment risks;,
- at the positions where the safety ledge is closed the pool edge should have a finger hold or handrail, according to EN 15288-1:2008+A1:2010, 5.6.2.1 and 5.6.2.2,
- at the positions where the safety ledge is closed a different coloured marking of the pool edge could be considered.

#### 5.1.8 Prevention of hazards coming from movement

The speed of a moveable floor shall be  $\leq 500$  mm/min.

A visual warning to prevent the use of the pool shall be given during the movement of the floor, and as long as the moveable floor is not locked in its working position.

NOTE Under certain circumstances, additional signals (e.g. audible signals) can be given.

Users shall be allowed in the pool only when the moveable floor is in its working position, ready for operation. When the area of the moveable floor is enclosed by a bulkhead in its working position, the above requirements apply only to the section where the moveable floor is installed.

The lifting of users with disabilities, also sitting in wheelchairs, is allowed under competent supervision. During floor movement, at least the area 500 mm wide from the pool wall shall be clear.

The instructions of the manufacturer/importer/supplier shall be followed, see Annex A.

#### 5.1.9 Prevention of hazards coming from water depth

The actual water depth in the area of the moveable floor shall be automatically and obviously displayed to the users approaching the moveable floor and standing on it. Water depth shall be displayed during pool operation.

If the floor can be tilted, it shall be fitted with displays, showing at least the lower and the higher water depth.

NOTE In larger installations, particular consideration should be given to the installation of intermediate water depth displays.

#### 5.1.10 Prevention of hazards coming from diving

The use of starting platforms in the area of a moveable floor shall be prevented when the water depth is not suitable, see EN 13451-4.

When a moveable floor is installed into a diving pool, and the minimum water depth for diving stated in EN 13451-10 is not provided, the use of the diving facilities shall be compulsorily prevented and a sign "do not dive" shall be on.

#### 5.1.11 Prevention of hazards coming from interference with other pieces of equipment

When other features are installed in a pool, which could interfere with a moveable floor (e.g. moveable bulkhead, disabled user hoist, etc.) a suitable interlocking system shall be provided, to avoid collisions and accidents.

**prEN 13451-11:2012 (E)****5.1.12 Prevention of interference with the circulation system**

If the pool has a moveable floor the circulation system shall be designed to cope with every configuration. It is important to ensure that water is distributed above and below moveable floors in all operating positions. This may necessitate incorporating inlets at different levels. Water removal should be via both the surface water system and outlets in the base of the pool (where the floor is located). The moveable floor should incorporate apertures to allow water to pass through, maintain the distribution within the structure and avoid pollution build-up in the dead spots created by ropes and pulleys. This is why periodic cleaning is important.

**5.2 Bulkheads****5.2.1 General**

Moveable bulkheads which fall under Directive 2006/42/EC [1] on Safety of Machinery shall also comply with EN ISO 12100, EN ISO 13850 and EN ISO 13857.

Bulkheads shall be fixed in their working position(s) by a tamper proof system.

The top walkable surface shall be horizontal. An inclination  $\leq 2\%$  is allowed for water drainage purposes.

The bulkhead design shall ensure the effectiveness of the water treatment system.

NOTE 1 In presence of a moveable bulkhead, the pool water treatment system should be specifically designed. A dye test to check the correct water distribution of the complete installation, with the bulkhead in the lowest working position, is advisable. As a bulkhead influences the water distribution the result of the dye test has to be evaluated in a different way (see EN 15288-2:2008, Annex A).

NOTE 2 It may be necessary to tighten the construction tolerances of the structure and finishes within the pool basin in order to meet the tolerances set out within this European Standard.

**5.2.2 Dimensions**

The dimensions indicated in Figure 1 shall be complied with. The design of the equipment does not need to comply with the examples given.

The width of the walkable area of a bulkhead shall be  $\geq 1\ 000$  mm.

If starting platforms are installed, the width of the walkable area behind the starting platform shall be  $> 600$  mm.

NOTE Dimensional requirements for competitive use, see the swimming governing body FINA (Fédération Internationale de Natation Amateur).

**5.2.3 Structural integrity****5.2.3.1 Vertical load**

Vertical area load shall be  $2\ 000\ \text{N/m}^2$ . For type 2, the contribution of any floating action shall not be considered.

**5.2.3.2 Horizontal load from users turning**

Horizontal area load, to cover the action of the users turning, shall be calculated as follows:  $1\ 000\ \text{N}$  per lane shall be uniformly applied in the area corresponding to the actual lane width  $\times$  the height from  $+ 300$  mm down to  $- 800$  mm from water level, see Figure 1.