



# SLOVENSKI STANDARD

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

Swimming pool equipment - Part 11: Additional specific safety requirements and test methods for moveable pool floors and moveable bulkheads installed in pools for public use

(standards.iteh.ai)

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

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Équipement de piscine - Partie 11 : Exigences de sécurité et méthodes d'essai complémentaires propres aux fonds de bassins mobiles et cloisons mobiles installés dans des piscines à usage public

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## Swimming pool equipment - Part 11: Additional specific safety requirements and test methods for moveable pool floors and moveable bulkheads installed in pools for public use

Équipement de piscine - Partie 11 : Exigences de sécurité et méthodes d'essai complémentaires propres aux fonds de bassins mobiles et cloisons mobiles installés dans des piscines à usage public

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This European Standard was approved by CEN on 28 November 2022.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION  
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## European foreword

This document (EN 13451-11:2022) 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 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 June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023.

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

This document supersedes EN 13451-11:2014.

EN 13451-11:2022 includes the following significant technical changes with respect to EN 13451-11:2014:

- normative references have been updated;
- requirements for the recessed ledges and steps have been modified;
- safety requirements for the prevention of interference with the circulation system have been added;
- requirement that no person shall be on the movable floor or bulkhead when moving has been added;
- new Annex A of all thinkable hazards has been added.

The EN 13451 series, under the general title “Swimming pool equipment”, consists of the following parts:

- Part 1: General safety requirements and test methods for equipment installed in pools for public use;
- 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 installed in pools for public use;
- Part 4: Additional specific safety requirements and test methods for starting platforms;
- Part 5: Additional specific safety requirements and test methods for lane lines and dividing line;
- 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 installed in pools for public use.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

**EN 13451-11:2022 (E)**

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

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## Introduction

This document is of relevance, in particular, for the following stakeholder groups representing the market players:

- manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.).

Others can be affected by the level of safety achieved with the means of the document by the above-mentioned stakeholder groups:

- operators/employers (small, medium and large enterprises);
- service providers, e.g. for maintenance (small, medium and large enterprises).

**NOTE** Due to the huge variety of individual drive systems, this document cannot provide specific requirements for each system. A risk assessment based on EN 15288-2 is recommended.

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## EN 13451-11:2022 (E)

### 1 Scope

This document specifies the safety requirements and the means of their verification for the design and construction of moveable pool floors and moveable bulkheads for use in classified swimming pools as specified in EN 15288-1 and EN 15288-2.

This document deals with all significant hazards, hazardous situations and events, as listed in Annex A, relevant to this equipment when used as intended and under the conditions of misuse reasonably foreseeable by the manufacturer during normal operation and service.

NOTE When requirements of this part of EN 13451 series are different from those which are stated in EN 13451-1, the requirements of this part of EN 13451 series take precedence over the requirements of EN 13451-1 for moveable floors and moveable bulkheads that have been designed and built according to the requirements of this part of EN 13451 series.

This document does not apply to installations or equipment intended to move people into or out of a pool tank.

This document is not applicable to equipment which is manufactured before the date of its publication as a European standard.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 13451-1:2020, *Swimming pool equipment — Part 1: General safety requirements and test methods for equipment installed in pools for public use*

EN 13451-4, *Swimming pool equipment — Part 4: Additional specific safety requirements and test methods for starting platforms*  
<https://standards.iteh.ai/catalog/standards/sist/8afd767f-77d1-4a1b-bedb-74ec9059e788/sist-en-13451-11-2023>

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

EN 13451-6, *Swimming pool equipment — Part 6: Additional specific safety requirements and test methods for turning boards*

EN 15288-1:2018, *Swimming pools for public use — Part 1: Safety requirements for design*

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

EN 62061, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1)*

EN ISO 13850, *Safety of machinery — Emergency stop function — 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)*

ISO 7010:2019, *Graphical symbols — Safety colours and safety signs — Registered safety signs*



### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13451-1:2020, EN 15288-1:2018 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1

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

adjustable floor located in a pool basin designed to change the water depth of the pool

Note 1 to entry: See Table 1.

#### 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 located in a pool basin, providing a solid partition to divide a pool into sections

Note 1 to entry: See Table 1.

#### 3.5

##### **closure device**

flexible device used to close gaps between the moveable floor/bulkhead and pool wall/floor

Note 1 to entry: For example, flexible lips, rubber gaskets, etc. can be used.

### 4 Classification of movable pool floors and movable bulkheads

For the classification, see Table 1.

**Table 1 — Classification**

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

**EN 13451-11:2022 (E)****5 Safety requirements****5.1 General**

Moveable floors and moveable bulkheads shall comply with the safety requirements of this clause. Hatches for service or cleaning in the moveable pool floor or the moveable bulkhead shall have a minimum diameter of 600 mm. If divers with their equipment need access, a minimum diameter of 800 mm is required. Square and rectangular shaped hatches are allowed, as long the main dimensions are considered.

NOTE 1 The minimum number of hatches can depend on the pools size.

The pool design shall ensure good water treatment throughout the pool with the moveable floor and or the moveable bulkhead. The design of water circulation shall take into account the need of equal flow in different pool areas when only a part of the complete pool is to be fitted with a moveable floor or bulkhead.

NOTE 2 It can be necessary to tighten the construction tolerances of the structure and finishes within the basin in order to meet the entrapment requirements according to this document.

During maintenance and inspection works performed in the area underneath the equipment:

- a) the operation of the equipment shall be prevented by tamper proof systems (power isolator lockable in the "off" position with a removable key);
- b) the equipment shall be secured against inadvertent movements.

The drive system shall only be accessible for maintenance and inspection. In all other cases, the accessibility shall be prevented. The access to the drive system shall only be possible for qualified persons, based on the manufacturer's risk assessment.

When applicable, the regulations for underwater working shall be complied with.

At least one survival area or one escape opening shall be provided in case the securing system fails.

NOTE 3 When the pool is fitted with a perimeter corridor, it is advisable to install an underwater window to allow visual control of the area underneath the equipment.

Where the manufacturer requires a specific supporting system to support the equipment in case the pool is empty:

- c) it shall always be used in accordance with manufacturer's instructions;
- d) if the system is designed to bear only the dead load of the equipment, access to its surface shall always be prevented.

Control systems of moveable floors and bulkheads shall be designed and constructed in such a way as to prevent hazardous situations while moving the moveable floor or bulkhead. They shall be designed and constructed in such a way that:

- e) a fault in the hardware or the software of the control system causes an emergency stop of the movement;
- f) the moveable floor or bulkhead does not start unexpectedly;
- g) a stop command leads reliably to a stop of the movement.

For cable-less control, an automatic stop shall be activated when correct control signals are not received.

Control devices shall be:

- h) clearly visible and identifiable;
- i) positioned in such a way as to be safely operated without hesitation or loss of time and without ambiguity, and give full view of the pool with the moveable floor or bulkhead;
- j) designed in such a way that the movement of the control device is consistent with its effect.

Where there is more than one control position, the control system shall be designed in such a way that the use of one of them precludes the use of the others, except for stop controls and emergency stops.

When movable floor or bulkhead has two or more control devices, each control device shall be equipped with all the required control functions.

If a movable floor stops in a water depth not specified by the manufacturer (e.g. by a power supply failure), the pool shall be closed for public use and a warning shall be given to the operator.

Moveable floors and bulkheads shall be designed and constructed in such a way that hazardous materials and substances (e.g. oil) of the construction cannot affect the pool water.

## 5.2 Moveable pool floors

### 5.2.1 General

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

It is necessary to pay special attention to the construction tolerances of the structure and/or finishes within the basin in order to meet the specification of EN 13451-1 within this document.

In presence of a moveable pool floor, the pool water treatment system shall be specifically designed considering possible changes in designation (e.g. a swimmers pool used as non-swimmers pool).

To check the correct water distribution of the complete installation a dye test shall be carried out in accordance with EN 15288-1 with the moveable floor in 2 positions:

- a) the lowest operating position; and
- b) 1/3 of the operating water depth measured from water surface.

Compliance with the dye test is achieved when colouring of the water in the pool tank above the moveable floor is attained in accordance with the requirements of EN 15288-1 after the dye is seen to clearly flow through the moveable floor.

NOTE It is likely that the cooperation of the pool builder will be required to achieve a suitable system.

Moveable floors shall allow inspection, cleaning and maintenance of the area underneath the moveable floor (e.g. hatches).

### 5.2.2 Structural integrity

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

- a) a vertical uniformly distributed load of  $600\text{ N/m}^2$ , for the complete floor;
- b) a vertical load of  $2\,000\text{ N/m}^2$  over a single square area of  $1\text{ m}^2$  at any point;
- c) a vertical load of  $8\,000\text{ N}$  over a square area of  $4\text{ m}^2$  focussed in front of the means of exit and similar areas.