



SLOVENSKI STANDARD

SIST EN 13451-11:2004

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

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

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

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

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

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

This European Standard was approved by CEN on 17 December 2003.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 13451-11:2004) has been prepared by the Technical Committee CEN /TC 136, "Sports, playground and other recreational 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 August 2004, and conflicting national standards shall be withdrawn at the latest by August 2004.

This 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 pool fittings 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*

The annexes A and B are normative.

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

EN 13451-11:2004 (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 specific standard 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 swimming pools.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 294, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs.*

EN 418, *Safety of machinery — Emergency stop equipment, functional aspects — Principles for design.*

EN 811, *Safety of machinery — Safety distances to prevent danger zones being reached by the lower limbs.*

EN 13451-1:2001, *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 driving platforms, diving springboards and associated equipment.*

EN 22768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1:1989).*

EN ISO 12100-1, *Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology.*

EN ISO 12100-2, *Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13451-1:2001 and the following apply.

3.1**moveable pool floor**

adjustable floor designed to change the water depth of the pool:

- Type 1: moveable floors bearing vertical loads by buoyancy only
- Type 2: moveable floors bearing vertical loads by mechanical drive systems integrated into the pool structure

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:

- Type 1: moveable bulkhead bearing vertical loads by buoyancy only
- Type 2: moveable bulkheads supported by the pool structure

4 Safety requirements**4.1 Moveable pool floors****4.1.1 General**

Wherever a tolerance is not indicated EN 22768-1 applies.

Moveable pool floors which fall under the Directive (98/37/EC) on Safety of Machinery shall also comply with EN ISO 12100-1, EN ISO 12100-2, EN 294, EN 418 and EN 811.

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

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

NOTE 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 colour test to check the correct water distribution of the complete installation, with the moveable floor in different positions, is advisable.

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

4.1.2 Structural integrity

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

- a vertical area load of 600 N/m^2 , evenly applied;
- a concentrated vertical area load of $2\,000\text{ N/m}^2$ over a square area of 1 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.

4.1.3 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.

EN 13451-11:2004 (E)**4.1.4 Prevention of entrapment****4.1.4.1 Gaps**

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

The gap between the rigid part of a moveable floor and the pool shall be ≤ 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.

NOTE E. g. flexible lips, rubber gaskets etc. can be used.

These closure devices shall pass the test defined in 5.2.

4.1.4.2 Recessed ledges and steps

When the pool is fitted with a recessed safety ledge, and/or with recessed built-in steps, the moveable floor working levels shall comply with the entrapment prevention requirements, see 4.8 of EN 13451-1:2001.

NOTE The moveable floor working positions should be flush with the surface of recessed built-in ledges/steps, with a tolerance of ± 20 mm.

4.1.5 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° of Table 1 of EN 13451-1:2001.

4.1.6 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.

4.1.7 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.

4.1.8 Prevention of hazards coming from movement

The speed of a moveable floor shall be ≤ 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.

4.1.9 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.

4.1.10 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.

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4.1.11 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.

4.2 Bulkheads

4.2.1 General

Wherever a tolerance is not indicated EN 22768-1 applies.

Moveable bulkheads which fall under the Directive (98/37/EC) on Safety of Machinery shall also comply with EN ISO 12100-1, EN ISO 12100-2, EN 294, EN 418 and EN 811.

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 In presence of a moveable bulkhead, the pool water treatment system should be specifically designed. A colour test to check the correct water distribution of the complete installation, with the bulkhead in different positions, is advisable.

4.2.2 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.