
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 pool fittings for water treatment purposes

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 aux équipements de traitement de l'eau

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This European Standard was approved by CEN on 13 January 2001.

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 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 Management Centre has the same status as the official versions.

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Foreword

iTeh STANDARD PREVIEW (standards.iteh.ai)

This European Standard has been prepared by 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of an identical text or by endorsement, at the latest by August 2001, and conflicting national standards shall be withdrawn at the latest by August 2001.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 9: Safety signs
- 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

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

1 Scope

This part of EN 13451 specifies safety requirements for pool fittings for water treatment purposes in addition to the general safety requirements of EN 13451-1:2001.

The requirements of this specific standard take priority over those in EN 13451-1:2001.

This part of EN 13451:2001 is applicable to manufactured pool equipment designed for the introduction and/or extraction of water treatment purposes.

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 13451-1:2001

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

EN 22768-1

General tolerances – Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1 : 1989)

3 Terms and definitions

For the purposes of this standard the terms and definitions of EN 13451-1:2001 and the following apply:

3.1 floor water inlets: A device fitted at the end of a pipe, designed to be installed into the pool floor for introducing water or to cover a channel.

3.2 wall water inlets: A device fitted at the end of a pipe, designed to be installed into the pool wall for introducing water.

3.3 floor water outlets: A device fitted to the end of a pipe designed to be installed into the pool floor for the extraction of water, by gravity or by suction.

3.4 wall water outlets: A device fitted at the end of a pipe, designed to be installed into the pool wall for the extraction of water, by gravity or by suction.

3.5 bottom drain: A device fitted to the end of a pipe, designed to be installed into the pool floor for draining/emptying the pool, by gravity or by suction.

3.6 skimmer: A device fitted to the end of a pipe, situated on the pool perimeter, designed to skim the water surface by extraction of the uppermost layer of water only, by means of a floating door, and return of water to the filtration system.

3.7 overflow channel: A channel located along the water line of the pool, designed to skim the water surface under gravity.

3.8 grid: A component to cover an overflow channel or an opening, designed to allow the passage of water.

4 Safety requirements

4.1 General

As the devices under clause 3 are always integrated components of a water circulation system, special attention shall be paid to the system design criteria, especially taking into consideration suitable safety factors (e.g. for the water column hammer).

Load, impact and vacuum test to be carried out in free air.

4.2 Structural integrity

4.2.1 Floor water inlets

Floor water inlets shall be tested for load, as stated in A.2.2 of EN 13451-1:2001.

Floor water inlets shall pass the load test in accordance with 5.2.1, impact test in accordance with 5.2.4 and the water pressure test in accordance with 5.2.2.

4.2.2 Wall water inlets

Wall water inlets fitted into a vertical wall, from water level until – 800 mm, shall be designed to withstand a load equivalent to 100 % of the load stated in A.2.2 of EN 13451-1:2001.

Wall water inlets fitted into a vertical wall, below – 800 mm, shall be designed to withstand a load equivalent to 10 % of the load stated in A.2.2 of EN 13451-1:2001.

Wall water inlets shall pass the load test in accordance with 5.2.1, the impact test in accordance with 5.2.4 and the water pressure test in accordance with 5.2.2.

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4.2.3 Floor water outlets

Floor water outlets shall be tested for load, as stated in A.2.2 of EN 13451-1:2001.

Floor water outlets shall pass the load test in accordance with 5.2.1, the vacuum test in accordance with 5.2.3 and the impact test in accordance with 5.2.4.

4.2.4 Wall water outlets

Wall water outlets fitted into a vertical wall, from water level until – 800 mm, shall be designed to withstand a load equivalent to 100 % of the load stated in A.2.2 of EN 13451-1:2001, and shall pass the impact test in accordance with 5.2.4.

Wall water outlets fitted into a vertical wall below – 800 mm shall be designed to withstand a load equivalent to 10 % of the load stated in A.2.2 of EN 13451-1:2001.

Wall water outlets shall pass the load test in accordance with 5.2.1, the impact test in accordance with 5.2.4 and the hair entrapment test in accordance with 5.4.

4.2.5 Bottom drains

Bottom drains shall be designed to withstand the load stated in A.2.2 of EN 13451-1:2001.

Bottom drains shall pass the load test in accordance with 5.2.1, the impact test in accordance with 5.2.4 and the vacuum test in accordance with 5.2.3.

4.2.6 Skimmers

The skimmers shall pass the vacuum test in accordance with 5.2.3.

The floating door, as an essential component for skimming the uppermost layer of the water only, shall be always properly working. It shall be removable only with the use of tools.

4.2.7 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 EN 13451-1:2001.

4.2.8 Overflow channels

When the overflow channel is designed to be covered by cover/grid, it shall withstand the same load of the grid itself.

They shall pass the load test in accordance with 5.2.1.

4.2.9 Grids

Grids made by separate elements, connected together to fit the right size, shall remain securely connected under conditions of use.

Grids shall be designed to withstand the load stated in A.2.2 of EN 13451-1:2001.

They shall pass the load test in accordance with 5.2.1.

4.3 Water speed at inlets

The maximum water speed at any inlet shall be 4 m/s.

4.4 Hair entrapment

Wall water outlets, floor water outlets and bottom drains shall pass the hair entrapment test in accordance with 5.4.

4.5 Slip resistance

4.5.1 Grids

Grids shall be secured in position to prevent their movement when subject to normal conditions of use.

The surface of walkable grids shall comply with the requirements of rating group 18° of table 1 of EN 13451-1:2001.

4.5.2 Surfaces of floor water inlets, floor water outlets, bottom drains

Surfaces greater than 200 mm at least in one dimension, which users can stand or walk onto, shall comply with the slip resistance rating group appropriate for the surrounding area, see table 1 of EN 13451-1:2001.

5 Test methods

5.1 General

Unless otherwise specified, the requirements of clause 4 shall be verified by the most appropriate method: measurement, visual examination or practical tests.

If the equipment has to pass two or more tests, all tests shall be carried out on the same test group conforming to the following sequence: load test, impact test, water pressure test, vacuum test.

At the end of each test, a visual inspection shall be carried out before subjecting the specimen to the subsequent test.

5.2 Structural integrity

5.2.1 Load test

Test a group of 10 specimens of the equipment.

Subject each of them to the following sequence:

- a) apply the load progressively onto the equipment placed in its normal working position;
- b) maintain the load for 5 min;
- c) after removal from the test fixture, apply water-soluble contrasting ink and inspect for cracks, breaks, fractures or plastic deformation.

The test is passed when the complete group of specimens doesn't show cracks, brakes, fractures or plastic deformation.

NOTE: Applicable loads see annex A of EN 13451-1:2001.

5.2.2 Water pressure test

Test a group of 10 specimens of the equipment.

Subject each of them to the following sequence:

- a) close one end of the fitting with a waterproof system;
- b) apply the maximum water pressure stated by the manufacturer, with a safety factor of 1,5;
- c) maintain the pressure for 5 min;
- d) after removal from the test fixture, apply water-soluble contrasting ink and inspect for cracks, breaks, fractures and plastic deformation.

The test is passed when the complete group of specimens doesn't show cracks, brakes, fractures or plastic deformation.

5.2.3 Vacuum test

Test a group of 10 specimens of the equipment.

Subject each of them to the following sequence:

- a) cover the pool side of the fitting with a 0,5 mm thick plastic film or other suitable material;
- b) connect the other side of the fitting to a vacuum system, and subject it to a 725 mm Hg vacuum within (60 ± 5) s, and maintain the vacuum for an additional (300 ± 10) s;
- c) cease the vacuum, remove the plastic film and carry on an impact test as stated in 5.2.4;

d) cover the pool side of the fitting with the 0,5 mm thick plastic film again and apply the 725 mm Hg vacuum within (60 ± 5) s, and maintain the vacuum for an additional (300 ± 10) s;

e) after removal from the test fixture, apply water-soluble contrasting ink and inspect for cracks, breaks, fractures and plastic deformation.

The test is passed when the complete group of specimens doesn't show cracks, brakes, fractures or plastic deformation.

5.2.4 Impact test

5.2.4.1 Principle

The specimen is subjected to the action of the hammer, falling from a height calculated vertically from the starting point to the impact point, in relation with the weight of the hammer.

5.2.4.2 Apparatus

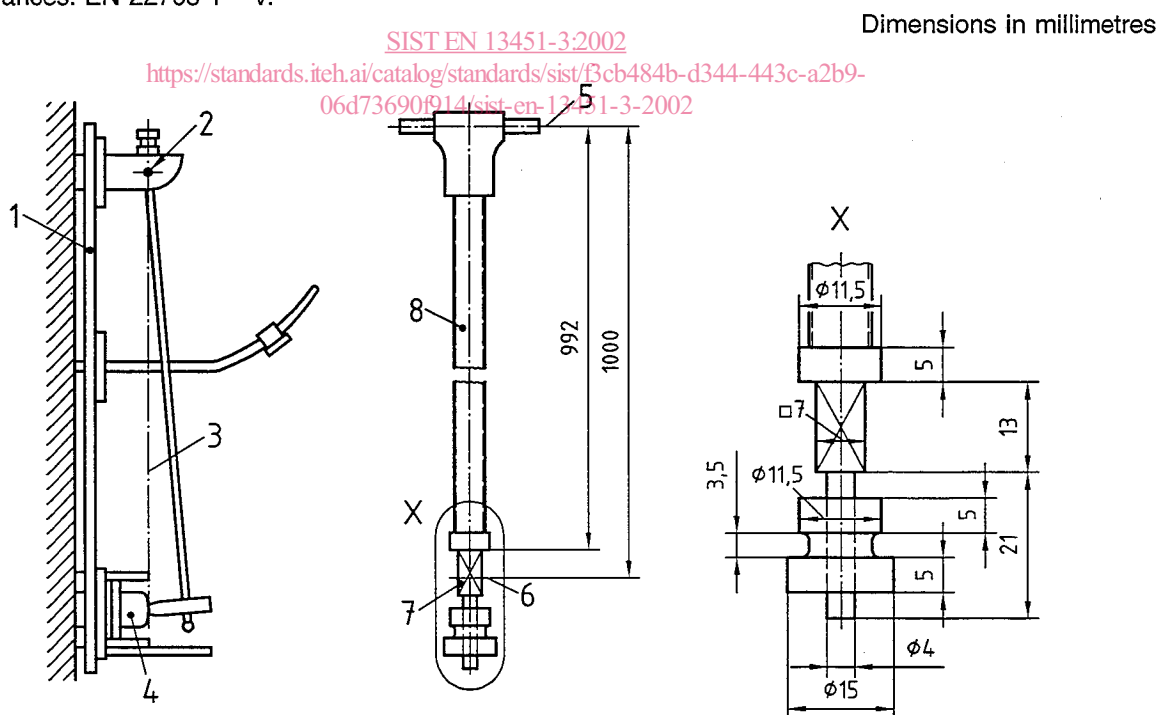
The rig is constituted by a pendulum, which is swinging on a horizontal axis and which is fitted in its lower part with a hammer. The hammer, once free without initial speed, falls under the effect of gravity and hits the specimen.

The arm of the pendulum is made by a steel pipe of 9 mm outer diameter and 8 mm of inner diameter. It has to be connected at the top with a structure bearing a shaft adjustable in distance from the supporting wall, to ensure that the pendulum swings on a vertical plane at 90° with the surface where the rig is fitted. On its lower part a system shall be provided to allow the installation of a hammer, see figure 1.

The length of the arm shall be defined in such a way to grant that the distance from the axis of swinging to the center of the hammer is 1 m.

The dimensions not indicated in the drawing shall be calculated in relationship with the weight of the hammer.

General tolerances: EN 22768-1 – v.



Key

- | | |
|---|--|
| 1 Shaft | 5 Swinging axis |
| 2 Adjustable swinging axis | 6 Hammer axis |
| 3 Vertical plane passing through the axis of the pendulum | 7 Hammer |
| 4 Lining | 8 Steel pipe (internal diameter 8 mm, outside diameter 9 mm) |

Figure 1: Pendulum for impact test