SLOVENSKI STANDARD
SIST EN 12616:2003

01-julij-2003

Podloge za športne dejavnosti – Ugotavljanje stopnje prepojitve z vodo

Surfaces for sports areas - Determination of water infiltrattion rate

Sportböden - Bestimmung der Wasserinfiltrationsmenge

Sols sportifs - Détermination de la vitesse d'infiltration de l'eau

Ta slovenski standard je istoveten z: **EN 12616:2003**

ICS:

97.220.10 Športni objekti Sports facilities

SIST EN 12616:2003 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12616

April 2003

ICS 97.220.10

English version

Surfaces for sports areas - Determination of water infiltrattion rate

Sols sportifs - Détermination de la vitesse d'infiltration de l'eau

Sportböden - Prüfverfahren zur Bestimmung der Wasserdurchlässigkeit

This European Standard was approved by CEN on 18 December 2002.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 12616:2003 E

Contents

Foreword

This document (EN 12616:2003) has been prepared by Technical Committee CEN/TC 217 "Surfaces for sports areas", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies three methods for the determination of water infiltration rate. Method A is suitable for synthetic, textile, synthetic turf and bound mineral sports surfaces, Method B is suitable for natural turf and Method C is suitable for unbound mineral sports surfaces.

NOTE For unbound mineral surfaces, laboratory tests are considered to give a more precise indication of how a surface will perform.

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 12229, *Surfaces for sports areas — Procedure for the preparation of synthetic turf and textile test pieces*.

3 Principle

Water is ponded within two concentric cylinders that have been sealed onto or hammered into the sports surface. The outer cylinder is used as a buffer area to prevent the lateral flow of water from the inner cylinder.

NOTE A single cylinder can be used if the test piece is fully sealed to prevent lateral flow of water.

The rate of entry into the sports surface from the inner cylinder is measured.

4 Apparatus

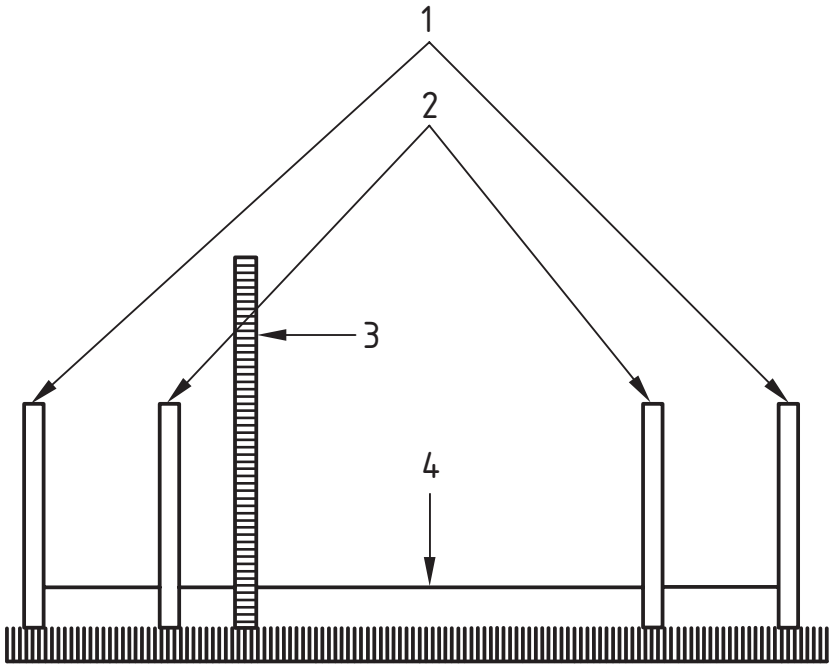
4.1 Infiltrometer, with dimensions specified in 4.1.1, 4.1.2 and 4.1.3, consisting of one or two metal cylinders (see Figure 1) capable of being sealed onto, or hammered perpendicularly into, the sports surface, as appropriate (see Figure 2).

4.1.1 Large cylinder, double-ring infiltrometer, for tests on surfaces with a rate of water infiltration less than 500 mm/h, consisting of an inner cylinder of inner diameter (300 ± 5) mm forming the measurement area and an outer cylinder of inner diameter (500 ± 25) mm forming the buffer area to prevent the lateral flow of water from the inner cylinder.

NOTE A wide tolerance on the cylinder diameter is permitted to allow the cylinders to be stacked for ease of transport.

4.1.2 Small cylinder, double-ring infiltrometer, for tests on surfaces with a rate of water infiltration greater than 500 mm/h and where the available water supply is limited, consisting of an inner cylinder of inner diameter (150 ± 5) mm and an outer cylinder of diameter (300 ± 25) mm.

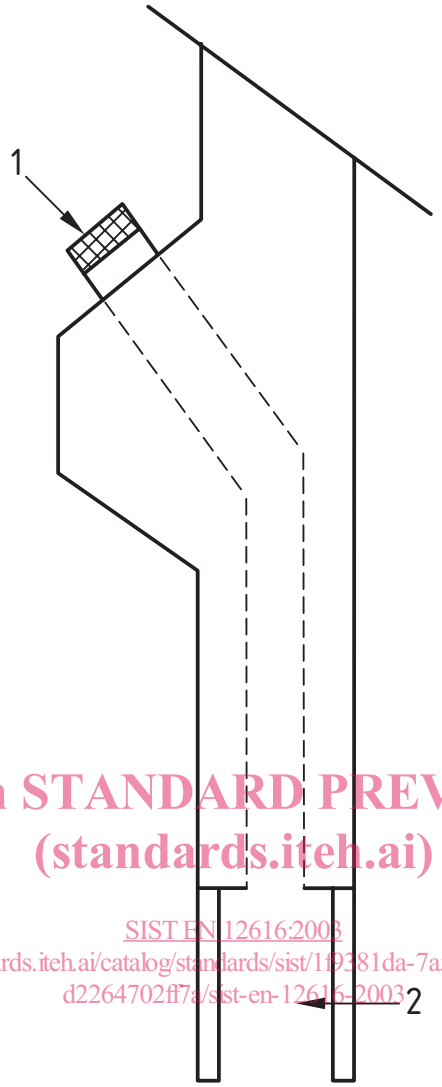
4.1.3 Single ring infiltrometer, in cases where the test piece can be fully sealed to prevent lateral flow of water, e.g. when measuring the rate of water infiltration in the laboratory, consisting of a single cylinder of dimensions conforming to the inner cylinder dimensions of 4.1.1 or 4.1.2.



Key

1 Outer cylinder
2 Inner cylinder
3 Scale
4 Water level

Figure 1 — Double ring infiltrometer



Key

1 Six grease nipples, where required, equally spaced around ring
2 Grease channel

Figure 2 — Example of method of sealing ring onto surface

4.2 Graduated scale or other apparatus, enabling the depth of water to be measured to an accuracy of 1 mm.

4.3 Clock, accurate to 1 s.

4.4 Temperature measuring apparatus, capable of measuring the temperature of the water to an accuracy of 1 °C.

4.5 Sealing material, low modulus elastomeric compounds, such as silicone rubber or a strip of closed-cell, compressible foam, to be used when a sealing material is required.

4.6 Water supply

4.7 Heavy weights, to apply to the top of the apparatus to improve the seal, particularly where the test surface is heavily textured.

5 Method A — Synthetic turf, textile, synthetic and bound mineral sports surfaces

5.1 Test specimen

A piece of sports surface of minimum length 1 000 mm and minimum width 1 000 mm, in combination with the supporting layers to be used in service, if required, and using the recommended method of attachment in accordance with the manufacturer's instructions.

Prepare laboratory tests specimens of either synthetic turf or textile materials in accordance with EN 12229.

5.2 Test conditions

Tests shall be carried out at the prevailing site conditions.

5.3 Number and distribution of test locations

On sports surfaces of less than 3 000 m^2 in area, at least one test reading shall be performed per 500 m^2. On sports surfaces larger than 3 000 m^2 at least one test reading shall be performed per 1 000 m^2. All test locations shall be selected at random.

5.4 Procedure

5.4.1 If sealing of synthetic turf is required, remove any particulate fill by vacuum to allow the rings to seal onto the primary backing of synthetic turf carpets and assist the prevention of lateral seepage of water. Do not disturb the particulate fill in the measurement area.

Seal the cylinders onto the sports surface with sealing material (4.5) taking care to ensure that the sealing material does not restrict water infiltration from any of the area enclosed by the inner cylinder. Apply the weights (4.7) if necessary.

5.4.2 Pond water in both cylinders until the flow of water into the inner cylinder is constant and the water level approaches a steady state value. Ensure that the water level in the outer cylinder is within ± 2 mm of the level in the inner cylinder.

5.4.3 Measure the water temperature in the inner cylinder.

5.4.4 Measure the time (t_A) for the water to fall by 20 mm from an initial ponding depth of (30 ± 1) mm to a final ponding depth of (10 ± 1) mm, or the fall in the water level (F_{WA}) after a minimum of 30 min, whichever is quicker.

NOTE The water levels between the cylinders can be maintained by the use of a siphon. Where a siphon has been employed, remove it before making any measurements.

If the test piece is laid on a slope, measure the depth of water at the location in each ring with the greatest depth of water.

5.5 Calculation and expression of results

Calculate the temperature-corrected water infiltration rate I_A, expressed in millimetres per hour, from the following equation:

$$I_A = \frac{F_{WA}\, C}{t_A}$$

where

F_{WA} is the fall of water level (mm);