



SLOVENSKI STANDARD
kSIST FprEN 12616:2013
01-marec-2013

Podloge za športne dejavnosti - Ugotavljanje stopnje prepojitve z vodo

Surfaces for sports areas - Determination of water infiltration rate

Sportböden - Bestimmung der Wasserinfiltrationsrate

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

Ta slovenski standard je istoveten z: FprEN 12616

ICS:

97.220.10 Športni objekti Sports facilities

kSIST FprEN 12616:2013 en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 12616

January 2013

ICS 97.220.10

Will supersede EN 12616:2003

English Version

Surfaces for sports areas - Determination of water infiltration rate

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

Sportböden - Bestimmung der Wasserinfiltrationsrate

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 217.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (FprEN 12616:2012) has been prepared by Technical Committee CEN/TC 217 "Surfaces for sports areas", the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12616:2003.

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 filled synthetic turf and unbound mineral surfaces, laboratory tests are considered to give a more precise indication of how a surface will perform.

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 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

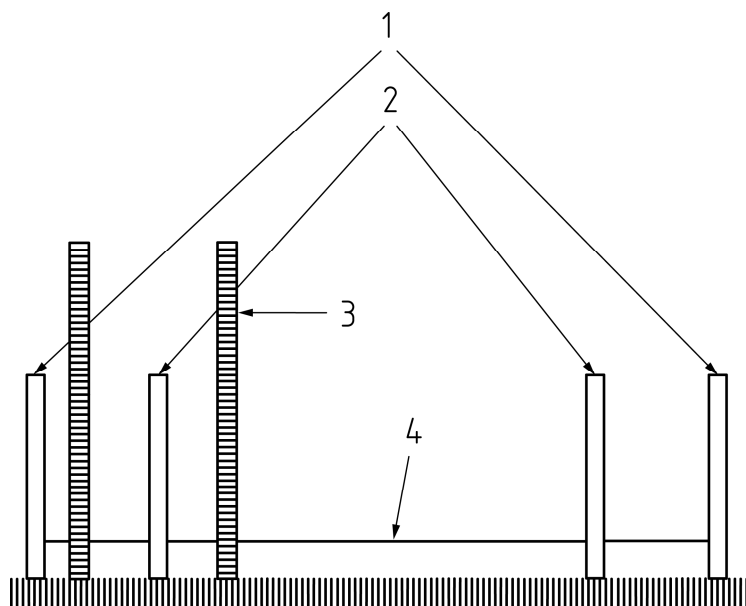
4.1 Infiltrometer, with dimensions specified in 4.1.1, 4.1.2 and 4.1.3, consisting of one or two metal cylinders (see Figure 1) capable of being sealed onto, or hammered perpendicularly into, the sports surface, as appropriate to minimise lateral leakage (see Figure 2).

4.1.1 Large cylinder, double-ring infiltrometer, for tests on synthetic turf and synthetic surfaces and mineral and natural turf 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.

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 mineral 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

- 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**, means of sealing the infiltrometer to the surface such as low modulus elastomeric compounds (silicone rubber or a strip of closed-cell, compressible foam).

NOTE On synthetic sports surfaces, self-adhesive, closed-cell foam strip such as is commonly used as a draught excluder has been found suitable. A low-modulus, elastomeric tubing, such as silicone, can also create an effective seal on some surfaces.

The sealant shall be chosen to leave no residue on the test surface.

- 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 – laboratory tests

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.

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The test specimen shall be selected so the infiltrometer is positioned with the minimum number of drainage holes (perforated into the sports surface backing) possible within the two rings.

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 site

Unless specified in the product standard, test locations on site shall be selected be as follows. On sports surfaces of less than 3 000 m² in area, at least one test reading shall be performed per 500 m². On sports surfaces larger than 3 000 m² at least one test reading shall be performed per 1 000 m². 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 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 water infiltration rate I_A , expressed in millimetres per hour, from the following formula:

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

where

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

t_A is the time taken for the water level to fall (h).