SLOVENSKI STANDARD
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Podloge za športne dejavnosti - Preskusne metode za ugotavljanje stopnje prepojitve z vodo in vodoravnega pretoka vode

Surfaces for sports areas -Test methods for the determination of vertical water infiltration and horizontal water flow rates

Sportböden - Prüfverfahren zur Bestimmung der vertikalen Wasserinfiltrationsrate und der horizontalen Wasserdurchflussrate

Sols sportifs - Méthodes d'essai pour la détermination de la vitesse d'infiltration verticale de l'eau et du débit d'eau horizontal

Ta slovenski standard je istoveten z: **prEN 12616**

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97.220.10	Športni objekti	Sports facilities

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English Version

Surfaces for sports areas -Test methods for the determination of vertical water infiltration and horizontal water flow rates

Sols sportifs - Méthodes d'essai pour la détermination de la vitesse d'infiltration verticale de l'eau et du débit d'eau horizontal

Sportböden - Prüfverfahren zur Bestimmung der vertikalen Wasserinfiltrationsrate und der horizontalen Wasserdurchflussrate

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

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 12616:2021) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports areas”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12616:2013.

In comparison with the previous edition, the following technical modifications have been made: a temperature correction factor has been reinstated (from the 2003 addition) and a laboratory test method for measuring the horizontal water flow rate has been added.

1 Scope

This European Standard has two parts.

Part 1 specifies four methods for the determination of the vertical water infiltration rate of different types of sports surfacing.

Method A is suitable for measuring the vertical water infiltration rate of synthetic, textile and synthetic turf sports surfaces in the laboratory.

Method B is suitable for on-site measurements of the Vertical Water Infiltration Rate of synthetic, textile, synthetic turf and bound mineral sports surfaces.

Method C is suitable for on-site measurements of the vertical water infiltration rate of natural turf sports surfaces.

Method D is suitable for measuring the for on-site measurements of the vertical water infiltration rate of 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.

Part 2 specifies a method for determining the horizontal water flow rate of synthetic, textile and synthetic turf surfaces in the laboratory.

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.

ISO 12958:2010, *Geotextiles and geotextile-related products – Determination of water flow capacity in their plane*

3 Terms and definitions

No terms and definitions are listed in this document.

4 Part 1 – Determination of vertical water infiltration rate

4.1 Method A – laboratory determination of synthetic turf, textile and synthetic sports surfaces

4.1.1 Principle

Water is ponded in a cylinder into which a test specimen has been sealed. The rate of flow through the sports surface is measured.

NOTE The test can be performed on a component of a sports surfacing system, e.g. on a shockpad or synthetic turf carpet, or on a total system.

4.1.2 Apparatus

4.1.2.1 Single ring infiltrometer, of metallic or plastic material with an internal diameter of 300 mm ± 2 mm and a method of sealing the ring to the product to be tested (either mechanically with a clamp or by use of a sealant).

4.1.2.2 **Support grid**, for underpinning the product to prevent it distorting when water is poured into the apparatus. The maximum deformation of the product shall be 5 mm from the outside of the ring to the centre once water has been added to the ring. Within the ring there should be three parallel horizontal wires or bars and a central bar perpendicular to the other three. These should be 2,5 mm ± 0,5 mm in width to prevent obstruction of any drainage holes in the sports surface.

Figure 1 — Single ring infiltrometer with supporting grid

4.1.2.3 **Stopwatch**, accurate to 0,1 s.

4.1.2.4 **Round disc**, with an internal diameter of 295 mm ± 2 mm and a mass of 5 kg ± 0,25 kg.

4.1.2.5 **Spirit level**.

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

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

4.1.2.8 **Geotextile or mesh grid**, with a mesh size no greater than 300 microns.

4.1.3 Test specimen

4.1.3.1 Select and prepare a test specimen of the sports surface ensuring that the minimum number of any drainage holes are visible within the 300 mm ring area. Measure the diameter and location of the holes within the test piece and record and/or photograph the evidence, which may be included in the report.

4.1.3.2 Seal or clamp the test specimen into the infiltration ring.

4.1.3.3 If required, fill the synthetic turf carpet in accordance with the manufacturer's instructions. Ensure that any pile fibres are visible and that there are no trapped fibres beneath the infill. Compress each infill layer using the round disc that should be rotated and contra-rotated on the test specimen for a minimum of five full rotations to ensure compaction and levelling of any the infill. Ensure no additional pressure is applied to the disc.

4.1.3.4 If a mesh support is used, ensure that there is no sagging of the test specimen that would result in an uneven head of water over the sample.

4.1.3.5 Wet the test specimen by applying a minimum of 5 l of water through the geotextile or mesh disc. Ensure there is no leaking of water laterally out of the ring joints; if there is, reseal the test specimen.

4.1.4 Conditioning

Condition the test samples and any relevant infill in the laboratory at a temperature of 23 °C ± 2 °C for a minimum period of 4 h.

4.1.5 Procedure

Ensure that the test ring is level prior to the start of the test.

Measure the temperature of the water.

Apply water evenly to the test specimen through the mesh or geotextile disc so that the head of water applied is between 70 mm and 90 mm above the top of the test specimen. For semi-filled synthetic turf surfaces, the top is defined as the top of the infill layer(s).

Mark the ring at 10 mm ± 1 mm and 30 mm ± 1 mm above the top of the test specimen.

Measure the time taken for the head of water to fall between the 30 mm and 10 mm markers to the nearest 0,1 s, ensuring that any geotextile or mesh disc is removed prior to the start of the timer. If the infiltration rate is slow, stop the test at 30 min.

Repeat the test a further two times.

4.1.6 Calculation and expression of results

Calculate the water infiltration rate I_A, expressed in millimetres per hour (mm/h), from the following formula:

$$I_A = (F_{WA} C) / t_A$$

where

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

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

C is the appropriate temperature correction factor given in Table 1, to correct the infiltration rate to a standard temperature of 10 °C.

Table 1 — Temperature correction factor

Temperature of water in inner cylinder °C	Correction factor	Temperature of water in inner cylinder °C	Correction factor
5	1,163	13	0,919
6	1,128	14	0,895
7	1,093	15	0,872
8	1,058	16	0,849
9	1,035	17	0,826
10	1,000	18	0,814
11	0,965	19	0,791
12	0,942	20	0,767

Calculate the mean value of the second and third tests.

4.1.7 Test report

The test report shall include the following information:

a) the sample;

b) reference to this European Standard, EN 12616:2021, and Part and method used, e.g. Part 1, Method A;

c) complete identification and photograph(s) of the sports surface tested;

d) water temperature;

e) any deviations from the procedure;

f) any unusual features observed;

g) the mean average of the test results;

h) the individual test result(s), including a reference to the clause which explains how the results were calculated;

i) the date of the test.

4.2 Method B – on-site determination on synthetic textile, synthetic turf, and bound mineral sports surfaces

4.2.1 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 (see 4.2.6).

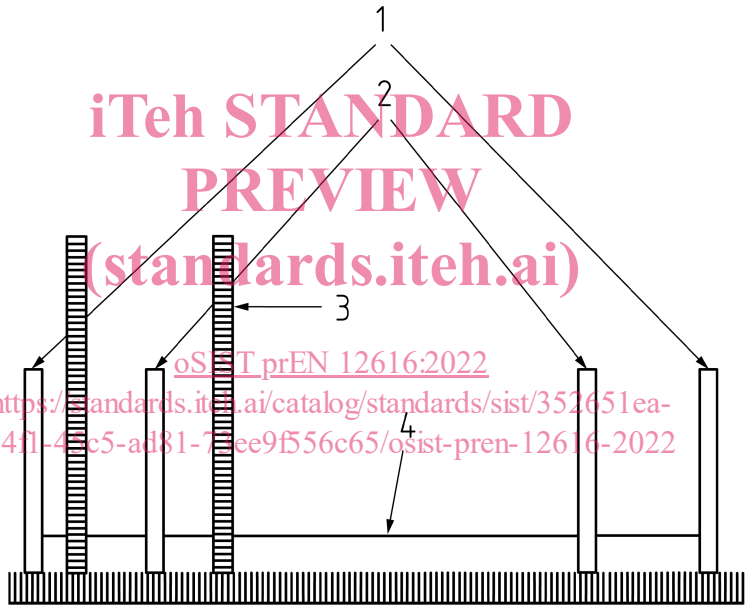
4.2.2 Apparatus

4.2.2.1 Infiltrometer, with dimensions specified in 4.2.2.2 and 4.2.2.3, consisting of one or two metal cylinders (see Figure 2) capable of being sealed onto, or hammered perpendicularly into, the sports surface, as appropriate to minimize lateral leakage.

4.2.2.2 Large cylinder, double-ring infiltrometer, for tests on synthetic, synthetic turf, 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.

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

4.2.2.3 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 inner diameter (300 ± 25) mm.



Key

1 outer cylinder
2 inner cylinder
3 scale
4 water level

Figure 2 — Double-ring infiltrometer

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

4.2.2.5 Clock, accurate to 1 s.

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