



BSI Standards Publication

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

National foreword

This British Standard is the UK implementation of EN 12616:2022. It supersedes BS EN 12616:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/57, Surfaces for sports areas.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 18714 4

ICS 97.220.10

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2023.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

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 European Standard was approved by CEN on 16 October 2022.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

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

Contents	Page
European foreword	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions.....	4
4 Part 1 – Determination of vertical water infiltration rate	4
4.1 Method A – laboratory determination of synthetic turf, textile and synthetic sports surfaces.....	4
4.2 Method B – on-site determination on synthetic textile, synthetic turf, and bound mineral sports surfaces	7
4.3 Method C – on-site determination on Natural turf.....	10
4.4 Method D – on-site determination unbound mineral surfaces	11
5 Part 2 – Determination in the laboratory of horizontal water flow rate	13
5.1 Principle	13
5.2 Apparatus	13
5.3 Test specimens	15
5.4 Conditioning	15
5.5 Procedure	15
5.6 Calculation and expression of results	16
5.7 Test report.....	17
Annex A (Informative) Sample preparation for the determination in the laboratory of horizontal water flow rate.....	18
Bibliography	19

European foreword

This document (EN 12616:2022) 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 July 2023, and conflicting national standards shall be withdrawn at the latest by July 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes 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 edition) and a laboratory test method for measuring the horizontal water flow rate has been added.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

1 Scope

This document 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.

EN ISO 12958-1:2020, *Geotextiles and geotextile-related products - Determination of water flow capacity in their plane - Part 1: Index test (ISO 12958-1:2020)*

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 $300 \text{ mm} \pm 2 \text{ mm}$ and a method of sealing the ring to the product to be tested (either mechanically with a clamp or by use of a sealant) (see Figure 1).

4.1.2.2 Support grid, for underpinning the product to prevent it distorting when water is poured into the apparatus (see Figure 1). 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 shall be three parallel horizontal wires or bars and a central bar perpendicular to the other three. These shall be $2,5 \text{ mm} \pm 0,5 \text{ mm}$ 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, resolution to 0,1 s.

4.1.2.4 Round disc, with an internal diameter of $295 \text{ mm} \pm 2 \text{ mm}$ and a mass of $5 \text{ kg} \pm 0,25 \text{ kg}$.

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 $300 \mu\text{m}$.

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.