SLOVENSKI STANDARD
SIST-TS CEN/TS 16384:2013

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Sintetični športni sistemi - Preskus izluževanja

Synthetic sport systems - Leaching test

Synthetische Sportsysteme - Auslaugungsprüfung

Systèmes sportifs synthétiques - Essai de lixiviation

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CEN/TS 16384

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Synthetic sport systems - Leaching test

Systèmes sportifs synthétiques - Essai de lixiviation

Synthetische Sportsysteme - Auslaugungsprüfung

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Foreword

This document (CEN/TS 16384:2012) has been prepared by Technical Committee CEN/TC 217 “Sport surfaces”, the secretariat of which is held by AFNOR.

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Introduction

To respond to the needs of buyers, end users and installers of synthetic sport systems for outdoor as well as to respond to the needs of producers of granulate as system constituents, CEN/TC 217 Working Group "Environmental Aspects" (WG 10) has worked on the following principles:

Firstly, define a laboratory test designed to assess the release of substances in ground water from a complete **"synthetic sport system for outdoor"**. The method of this test is based on the principle of large-scale in-situ tests (lysimeters). This test uses a sample of a sport surface similar to the sample used for laboratory type tests and representative of the system that will be installed.

Secondly, make it possible for integrators to assess specific leaching characteristics of relevant components and anticipate the results of the above laboratory test, specifying testing standards for a relative leaching assessment of system's constituents of different origins or nature, for instance granules (see Annex A).

NOTE This Technical Specification is based on the available knowledge and expertise. It is expected that it will be used in a harmonised way by the European Laboratories during the first three-years period and that this will result in an extended experience. Based on such experience, it is expected that the Technical Specification could be improved and transformed into an EN standard.

This document includes one normative annex and one informative annex. Additional information will be found in a guidance document in preparation.

1 Scope

This Technical Specification specifies testing methods concerning the release from synthetic sport systems for outdoor of substances in ground water, surface water and drainage water by performing a dedicated leaching test on a sample of a **"synthetic sport" system for outdoor**.

In addition, this Technical Specification provides tools for a relative leaching assessment of system's components (e.g. granules) of different origin or nature.

This Technical Specification does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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 ISO 3696, *Water for analytical laboratory use – specification and test methods (ISO 3696)*

EN ISO 5667-3, *Water quality – Sampling – Part 3: Guidance on the preservation and handling of water samples (ISO 5667-3)*

EN 12506, *Characterization of waste – Analysis of eluates – Determination of pH, As, Ba, Cd, Cl-, Co, Cr, Cr VI, Cu, Mo, Ni, NO2-, Pb, total S, SO42-, V and Zn*

EN 13370, *Characterization of waste – Analysis of eluates – Determination of Ammonium, AOX, conductivity, Hg, phenol index, TOC, easily liberatable CN-, F-*

EN 14877, *Synthetic surfaces for outdoor sports areas – Specification*

EN 15330-1, *Surfaces for sports areas – Synthetic turf and needle-punched surfaces primarily designed for outdoor use – Part 1 : specification for synthetic turf*

3 Terms and definitions

For the purposes of this document, the following term and definition applies.

3.1
synthetic sport system
system above groundwater level used as "synthetic sport" and incorporating all the components needed between the support layer and the atmosphere

4 Symbols and abbreviations

None

5 Principle

The principle of this test is to simulate the phenomena observed on outdoor synthetic sport systems. It ensures, in particular, a short contact time between the synthetic sport system and water, corresponding to the draining function of this surfaces. The spraying system is conventionally adjusted to alternate particularly dry and wet periods. Prior to the test performance, the sample may be submitted to standardised aging. Therefore in the testing report, it has to be noted if the sample was subjected to aging or not. If the sample was subjected to aging, the test used for the aging has to be mentioned as well.

NOTE The sample is of the same type as the one used for mechanical test and ensures testing on significant quantities of tested materials (EN 15306).

6 Apparatus and reagents

6.1 General

This clause defines the apparatus and reagent to be used. This is mainly done in normative terms. Therefore the informative Annex B provides an example of apparatus that meet the requirements specified in this clause.

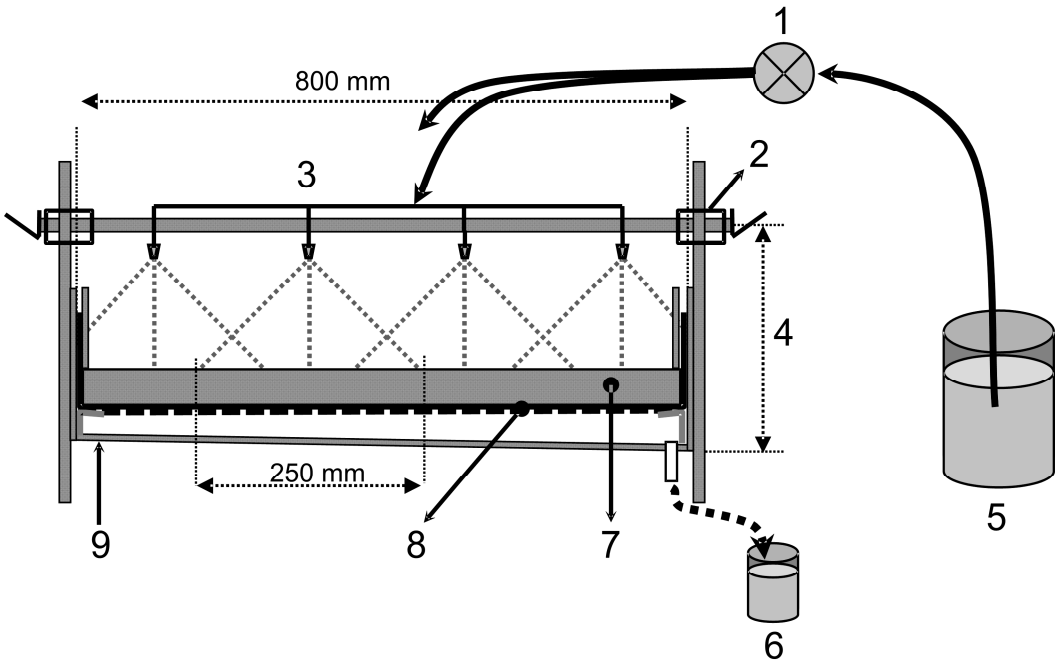
6.2 Tank

The tank (see Figure 1) and the vertical supports that allow the adjustment of rods and guide rods of the watering ramp are made of stainless steel or polycarbonate. The materials and fabrication method has to be such that the result of the blank test fulfils the requirements specified in 7.2. The tank dimensions are as follows: L = 800 mm (+/- 5 mm), W = 400 mm (+/- 5 mm), H = 150 mm and 160 mm (to slope the bottom a little) similar to the dimensions in EN 15306. A hole is drilled at the bottom point for the passage of the percolate drain pipe.

6.3 Watering system

The watering system is aiming at wetting in an homogeneous way the sample by means of a spraying system (see Figures 1 and 2) which consists of 8 full cone spraying nozzles attached to each of the guiding rods. These nozzles are selected and arranged so that

a) the diameter of the spray on the sample surface has a diameter of 200 mm – 250 mm in order to obtain a complete coverage (see Figure 3).



Key

1 dosing pump
2 core tuning
3 watering ramp
4 adjustment height
5 water reserve tank
6 percolates recovery recipient
7 "artificial turf" system
8 stainless steel grid
9 stainless steel tank (80 cm x 40 cm)

Figure 1 — Functional diagram - Longitudinal view (informative)

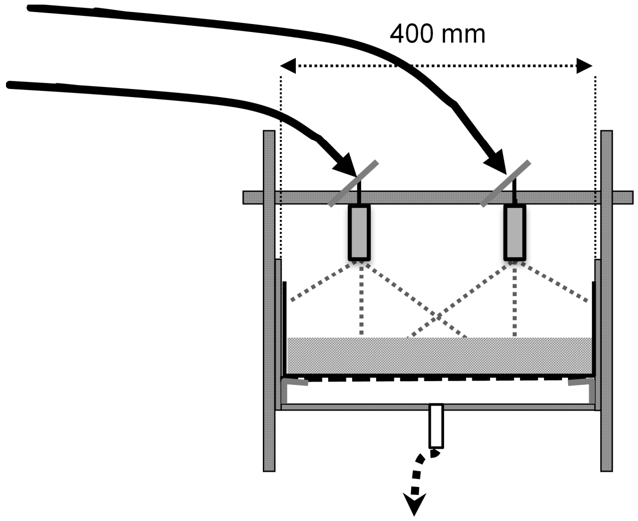


Figure 2 — Functional diagram - Transverse view (informative)

b) The spraying system is fed by a moving device (see Figure 1) either a dosing pump connected to a storage tank of water or a pressurised (with clean compressed air) storage tank of water. The water flow shall be maintained at the required flow ± 10 %.

c) The required flow shall be achieved with a water pressure at the spray nozzle in the range 1,4 bar – 1,6 bar, without visible haze. A cover may be used to minimise air draught and water carry over.

d) The quality of this water shall be in accordance with the following specification: Distilled water, demineralised water, de-ionised water or water of equivalent purity with a conductivity < 0,5 mS/m according to grade 3 specified in EN ISO 3696, and exhibiting a pH in a narrower range (6,5 < pH< 7,5) than the range of grade 3 specified in EN ISO 3696. If needed a dilute solution of sodium hydroxide may be used to adapt the pH range.

NOTE 1 This specification is defined as a convention relevant for the exposure of synthetic sport system. The experimental set up specified in this Technical Specification allows a relevant selection of the leachant since it is continuously renewed and therefore exposing the sample to the same liquid quality during the whole test. In order to secure repeatable and comparable results a selection of leachant should be made. The above specification is used in several CEN leaching standards with pH range (5 < pH < 7,5) which do not influence the leaching results under permanent and long lasting contact with the leachant. Such leaching tests are aiming at an equilibrium generally imposed by the sample. For synthetic sport systems a narrower pH range is needed (6,5 < pH < 7,5). The reason is that the pH is not influenced significantly during the short and intermittent contact with the leachant, due to the main function of the synthetic sport system securing a very fast water drainage.

NOTE 2 An impact of the surface tension of the leachant has been reported. It is therefore wise to determine and report this surface tension.

The "synthetic sport" system is laid on top of the stainless steel grid.

This grid is designed in order to avoid immersion of the synthetic sport sample and to facilitate drainage.

The selected spray nozzles shall have a maximum spraying angle of 110° (full cone angle) and a minimum spraying angle of 40° (full cone angle). This corresponds to a minimum height between the spray nozzles and the sport surface.

Qualification tests shall be carried out on the apparatus to verify that the spray pattern is homogeneous over the entire surface by checking the flow rate of each spray nozzle (e.g. by placing cups on the sport surface).

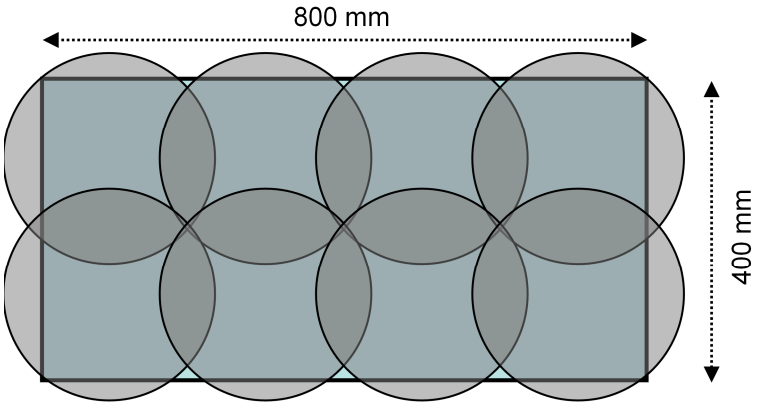


Figure 3 — Functional diagram - Spraying surface (informative)

A "blank test" is to be performed without the synthetic sport system to verify that the impact of the apparatus on the percolates is significantly below the regular test results.

6.4 Choice and quantity of tested materials

The tested system is representative for the system defined by the system supplier. It integrates all the components used on a “synthetic sport” system as specified by the system supplier.

For example, for a synthetic sport system for outdoor and with performance infill, the elements to be considered are the following:

- The fibres, backing and coating: The sample integrates a white strip (marking line on the grounds) and the glue if it is present on the marketed system.
- The performance infill: To ensure the representativeness of the material, a representative sample has to be taken.
- The stabilising infill: To guarantee representativeness, the tested sample shall be representative of the production intended for the “synthetic sport” system
- The shockpad: The dimensions 800 mm x 400 mm are assumed to be representative of the production intended for a large-scale “synthetic sport” system.

7 Procedure

7.1 Testing conditions

7.1.1 Frequency/duration of the spraying/non-spraying periods and the flow rate

For a week there are two days without spraying and five days with spray twice a day (each of 10 L/m^2 i.e. 3,2 L = 0,4 L per nozzle and per spray) with the non-spraying period of each day being at least 6 h and less than 6 h and 15 min. The duration of each spraying period shall be at least 45 s and less than 120 s

NOTE This amount can be split over two weeks. Each week would consist of five consecutive days with spraying and two days without spraying and consequently without collection of percolate. For each day there would be two sprays, each of 10 L/m^2 (i.e. 3,2 L) with the non-spraying period of each day being at least 6 h and less than 6 h and 15 min.