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Specifikacija materialov za zapolnitev**

Surfaces for sport areas - Synthetic turf and textile sports surfaces - Part 5: Specification for infill materials

Sportböden - Kunststoffrasenflächen und textile Sportflächen - Teil 5: Spezifikation für Verfüllgut

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## Surfaces for sport areas - Synthetic turf and textile sports surfaces - Part 5: Specification for infill materials

Sportböden - Kunststoffrasenflächen und textile Sportflächen - Teil 5: Spezifikation für Verfüllgut

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**prEN 13550-5:2022 (E)**

## **European foreword**

This document (prEN 15330-5:2022) 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 CEN Enquiry.

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## 1 Scope

This document:

- a) specifies minimum performance and durability and requirements for infill materials used in synthetic turf, and textile sports surfaces;
- b) describes how the performance of an infill is to be measured, and the results classified;
- c) specifies the physical and chemical properties of an infill that are to be declared in a manufacturer's product declaration;
- d) specifies minimum production control tolerance to ensure consistency of infill materials between production batches;
- e) describes how reclaimed infill is to be tested to assess its suitability for reuse.

NOTE 1 The sports performance characteristics of a synthetic turf or textile sports surface are provided by the combined characteristics of the synthetic turf or textile surface, any infill within the playing surface pile and any shockpad. The selection of the correct permutations of each is complex and the responsibility of the sports surface designer.

NOTE 2 If infill materials migrate from a synthetic turf or textile sports surface into the surrounding natural environment, they become a source of contamination. To minimize the risk this occurring, guidance on how to prevent infill migration from the sports facility is given in CEN Technical Report PD CEN/TR 17519.

## 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 71-3:2019+A1:2021, *Safety of toys — Migration of certain elements*

EN 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method*

EN 933-2, *Tests for geometrical properties of aggregates — Part 2: Determination of particle size distribution — Test sieves, nominal size of apertures*

EN 1097-3, *Tests for mechanical and physical properties of aggregates — Part 3: Determination of loose bulk density and voids*

EN 12616, *Surfaces for sports areas — Determination of water infiltration rate*

EN 12229, *Surfaces for sports areas — Procedure for the preparation of synthetic turf and needle-punch test pieces*

EN 13817, *Surfaces for sports areas — Procedure for accelerated ageing by exposure to hot air*

EN 14810, *Surfaces for sports areas — Determination of spike resistance*

EN 14836, *Surfaces for sports areas — Synthetic surfaces for outdoor sports areas — Test method for artificial weathering*

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EN 14955, *Surfaces for sports areas — Determination of composition and particle shape of unbound mineral surfaces for outdoor sports areas*

EN 15051, *Workplace exposure — Measurement of the dustiness of bulk materials*

EN 17409, *Surfaces for sports areas — Code of practise for the sampling of performance infills used within synthetic turf surfaces*

EN 17467, *Surfaces for sports areas — Test method for the determination of the residual deformation of synthetic or organic infill granules after static load*

EN 20105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour (ISO 105-A02)*

EN ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system (ISO 7500-1)*

EN ISO 9239-1, *Reaction to fire tests for floorings — Part 1: Determination of the burning behaviour using a radiant heat source (ISO 9239-1)*

ISO 11358-2, *Plastics — Thermogravimetry (TG) of polymers — Part 2: Determination of activation energy*

CEN/TS 16384:2012, *Synthetic sport systems — Leaching test*

CEN/TR 17519, *Surfaces for sports areas — Synthetic turf sports facilities — Guidance on how to minimize infill dispersion into the environment*

Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulations of the European Union <https://standards.iteh.ai/catalog/standards/sist/d4be8b49-1a32-453d-b8ea-3566da7d2544/osist-pren-15330-5-2022>

**3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

**3.1  
infill**

particulate materials installed within or over the pile of a synthetic turf or textile sports surface, to aid the provision of the required playing characteristics and to provide weight and stability to the surface

**3.2  
sport surfacing system**

all components that influence the sports performance, bio-mechanical and durability characteristics of the playing surface, including the sports carpet, any infill and any shockpad

**3.3  
sports carpet**

synthetic turf or textile carpet that comprises the main component of a sports surfacing system

**3.4****performance infill**

granular infill material that contributes to the playing characteristics of the surface and assists in stabilising the sports carpet

Note 1 to entry: The performance infill can also act as the stabilizing infill.

**3.5****stabilizing infill**

granular infill material that assists in stabilising the sports carpet

**3.6****coated infill**

granular infill material (e.g. sand) that has a polymeric coating

**3.7****reclaimed infill**

infill taken from an existing synthetic turf field for reuse after being cleaned and processed for reuse

**3.8****reference sample**

infill as supplied by the manufacturer or supplier, and that has not been subjected to any sample conditioning or testing

**3.9****manufacturer's product declaration**

statement or datasheet provided by the manufacturer or supplier of the infill that describes the composition and expected performance of the infill

**4 Sampling**

Sampling of infill materials to demonstrate compliance with this standard shall be undertaken in accordance with EN 17409.

Following normal production processes, test samples shall not be washed prior to test.

If samples are supplied in a moist or wet condition and require drying prior to test, they should be dried placed in an air circulating oven operating at a temperature of  $(60 \pm 2)$  °C. They should remain in the oven until they reach a constant weight. Tests should not be performed for at least 30 min after removal of the sample from the oven, to allow cooling to room temperature.

To enable blended infills to be tested, samples of the blended material, plus samples of each constituent part, should be supplied to the laboratory.

## 5 Classification

Based on the composition of the infill it shall be classified in accordance with Table 1.

**Table 1 — Infill type classification**

Infill type	Characteristics
Polymeric infill	An infill containing more than 1 % by mass of a synthetic material such as rubbers and plastics.
Vegetal infill	An infill produced entirely from naturally occurring vegetal materials, e.g. cork, coconut fibre, nut husks, etc.
Mineral infills	An infill produced entirely from naturally occurring in-organic materials, e.g. sand.
Blended infills	A mix of infill types, that does not comply with any of the classifications detailed above.
NOTE 1 The 1 % by mass applied to the definition of a polymeric infill is based on criteria defined by the European Chemical Agency.	
NOTE 2 Vegetal infills are also known as organic infills.	

Blended infills shall be tested in accordance with the requirements of the majority constituent (by mass) part, e.g. if a blended infill comprises 70 % vegetal infill it shall be tested, where appropriate, as a vegetal infill.

## 6 Physical properties

### 6.1 General

The physical properties of the infill material shall be measured and reported in accordance with 6.2 to 6.6.

### 6.2 Infill composition

A description and photographic record of the infill shall be included in the test report.

### 6.3 Particle size distribution

The particle size distribution of the infill material shall be determined in accordance with EN 933-1.

A minimum of eight sieves shall be used, from the range of mesh sizes detailed in Table 2. The 0,00 mm, 0,063 mm and 0,125 mm shall always be used. The remaining sieves shall be spaced across the aperture sizes  $d$  and  $D$  of the designated product size, with the largest sieve allowing 100 % of the infill to pass.

**Table 2 — Sieve mesh sizes (mm)**

0,00	0,063	0,125	0,200	0,250	0,315
0,500	0,630	0,800	1,00	1,25	1,60
2,00	2,50	3,15	4,00	5,00	6,30

The sieve apertures shall be as specified in EN 933-2 and conform to the requirements of ISO 3310-1 and ISO 3310-2.

The sieves shall be mounted in a mechanical device that applies a 3-dimensional vibrating movement. The equipment shall have a timer and amplitude settings. The amplitude shall be set at  $(1,5 \pm 0,1)$  mm.

The duration of the sieving operation shall be  $(20 \pm 1)$  min.

The results of the test shall be reported using the procedure described in Annex A.

NOTE Tests can also be undertaken using dynamic image analysis methods in accordance with ISO 13322-2 providing the results are reported in a format compatible with that specified in EN 933-1 and Annex A.

## 6.4 Particle shape

The particle shape of the infill material shall be determined in accordance with EN 14955.

## 6.5 Bulk density

The bulk density of the infill material shall be determined in accordance EN 1097-3.

Tests shall be made with the infill dried in accordance with the procedure for lightweight aggregates detailed in EN 1097-3 and also with the infill at its optimum moisture content as specified by the manufacturer/supplier, where appropriate.

## 6.6 Polymer characterization

The characterization of any polymers (rubbers or plastics, etc.) forming part of the infill (including coatings) shall be determined using the procedure described in EN ISO 11358-2.

## 7 Performance and material requirements

### 7.1 Elastic properties

The elastic properties of performance infills shall be measured using the procedure described in Annex B and the result classified in accordance with Table 3.

**Table 3 — Classification of elastic properties**

Classification	Range
Non-elastic	< 10 %
Low elasticity	$\geq 10 \leq 20$ %
Medium elasticity	$> 20 \leq 40$ %
High elasticity	> 40 %

### 7.2 Resistance to residual deformation after static load

When tested in accordance with EN 17467 polymeric infills shall satisfy the following requirements:

- the residual deformation shall not exceed 50 %;
- there granules shall not be agglomerated;
- there shall be no visible signs of oil secretion.