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**Podloge za športne dejavnosti - Umetne travnate podloge in iglane podloge, predvsem za zunanjo uporabo - 4. del: Specifikacija oblog za blaženje udarcev pri umetnih travnatih ter tekstilnih podlogah**

Surfaces for sports areas - Synthetic turf and needle-punched surfaces primarily designed for outdoor use - Part 4: Specification for shockpads used with synthetic turf, needle-punch and textile sports surfaces

Sportböden - Überwiegend für den Außenbereich hergestellte Kunststoffrasenflächen und Nadelfilze - Teil 4: Festlegungen für Elasticschichten, die in Kunststoffrasenflächen, Nadelfilzen und textilen Sportbelägen eingesetzt werden

Sols sportifs - Surfaces en gazon synthétique et surfaces en textile aiguilleté principalement destinées à l'usage en extérieur - Partie 4 : Spécifications relatives aux couches de souplesse utilisées avec les sols sportifs en gazon synthétique, en textile et en textile aiguilleté

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**Surfaces for sports areas - Synthetic turf and needle-punched surfaces primarily designed for outdoor use - Part 4: Specification for shockpads used with synthetic turf, needle-punch and textile sports surfaces**

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

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

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## European foreword

This document (prEN 15330-4:2020) 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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**prEN 15330-4:2020 (E)****1 Scope**

This document specifies minimum performance and durability requirements for shockpads within sports surfacing systems. It applies to any type shockpad used as an elastic component in sports surfacing system.

The document also specifies appropriate performance tolerance for production and on-site quality control procedures.

This document does not cover structural or drainage properties of shockpads. Where appropriate compliance with other European or national standards and guidelines for these aspects, should be followed.

NOTE 1 The sports performance characteristics of a sports surfacing system are provided by the combined characteristics of the playing surface, any infill within the playing surface and the shockpad. The selection of the correct combination of each is complex and the responsibility of the sports surface system designer. It is important to take this into account when considering the performance of a shockpad. A shockpad alone is not be expected to satisfy the performance requirements of the complete sports surfacing system as specified in EN 15330-1, EN 15330-2, EN 14877 or EN 14904, etc.

NOTE 2 This document only refers to the shockpad. It makes no recommendations on sub-base constructions or the different synthetic turf for needle-punch textile sports surface designs.

NOTE 3 Annex E is used in those countries where national guidance or regulations are not available. If such guidance or regulations are available, they supersede Annex E.<sup>1</sup>

**2 Normative references**

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The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

EN 1969, *Surfaces for sports areas — Determination of thickness of synthetic sports surfaces*

EN 12616,<sup>2</sup> *Surfaces for sports areas — Determination of water infiltration rate*

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

EN 12230,<sup>3</sup> *Surfaces for sports areas — Determination of tensile properties of synthetic sports surfaces (currently under preparation by CEN TC 217)*

EN 12664, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Dry and moist products of medium and low thermal resistance*

CEN/TS 16717, *Surface for sports areas — Method of test for the determination of shock absorption, vertical deformation and energy restitution using the advanced artificial athlete*

EN 17324, *Surfaces for sports areas — Test method for the determination of the resistance to dynamic fatigue of shock pads and sports surfaces*

ISO 845, *Cellular plastics and rubbers — Determination of apparent density*

<sup>1</sup> CCMC advises to carefully validate this NOTE during Enquiry.

<sup>2</sup> New edition under preparation.

<sup>3</sup> New edition as new series (3 parts) under preparation.



ISO 8543, *Textile floor coverings — Methods for determination of mass*

ISO 11357, *Plastics — Differential scanning calorimetry (DSC)*

### 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 <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### **shockpad**

elastic material placed beneath a synthetic turf, needle-punch or textile sports surface that is designed to aid the provision of the performance properties of the sports surfacing system and fully complies with this document

#### 3.2

##### **sports surfacing system**

all components of the playing surface that influence its sports performance or bio-mechanical characteristics of the product. These typically comprise the playing surface (e.g. synthetic turf, synthetic surface, etc.), any infill laid within the playing surface and the shockpad. They may also include any supporting layers or components designed to contribute to the performance of the surface

#### 3.3

##### **pre-fabricated shockpad**

shockpad manufactured in a factory and normally comprising rolls or tiles that are transported to site laid on the base or floor of the sports area

#### 3.4

##### **in-situ shockpad or elastic layer**

shockpad formed as a wet pour mix and normally incorporating a binder (e.g. polyurethane) and elastomeric granulate (e.g. rubber granulate) that is mixed and machine-laid on site on the base or floor of the sports area

#### 3.5

##### **product declaration**

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

#### 3.6

##### **FR absolute**

outright difference in measurements of shock absorption

### 4 Laboratory conditions and sample conditioning

#### 4.1 Test floor

Shock absorption and deformation tests shall be made on a rigid concrete floor concrete comprising a rigid, non-vibrating, smooth, level and even concrete floor on which a peak force ( $F_{max}$ ) of  $(6,60 \pm 0,25)$  kN is achieved.

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The shockpad shall be attached to the concrete floor using (50 ± 5) mm wide double-sided sticking tape. This shall be attached to the outer edges of the test specimen.

**4.2 Test environments**

As specified tests shall be carried out under the conditions detailed in Table 1.

**Table 1 — Test conditions**

Test condition			Test specimen conditioning	Test temperature	Use of load spreading palate
4.2.1	Dry	Clause 4.3.1	Standard laboratory conditions	(23 ± 2) °C	No
4.2.2	Dry	Clause 4.3.1	Standard laboratory conditions	(23 ± 2) °C	Yes
4.2.3	Wet	Clause 4.3.2	Standard laboratory conditions	(23 ± 2) °C	Yes
4.2.4	Dry	Clause 4.3.3	Tests at elevated temperature	(40 ± 2) °C	Yes
4.2.5	Dry	Clause 4.3.4	Tests at sub-ambient temperature	(5 ± 2) °C	Yes
4.2.6	Dry	Clause 4.3.5	Following accelerated air ageing in accordance with EN 13817	(23 ± 2) °C	Yes
4.2.7	Frozen	Clause 4.3.6	Tests under freezing conditions	(-5 ± 2) °C	Yes

**4.3 Procedure for sample conditioning****4.3.1 Standard laboratory conditions**

Unless otherwise specified tests should be undertaken under standard laboratory tests conditions of (23 ± 2) °C. The test sample shall be conditioned for a minimum of 3 h at the specified temperature prior to test.

NOTE As shockpads are generally not sensitive to humidity it is not considered necessary to specify strict humidity conditions for the laboratory. Nevertheless, it is advisable for the humidity to be nominally 50 % RH.

### 4.3.2 Procedure for wet tests

Wet test conditions shall be produced by immersing the shockpad in water to a depth of at least 10 mm above the top of the shockpad. After a minimum of 30 min, remove the tests specimen from the water and place it on a free draining base to allow it to drain by gravity for  $(5 \pm 2)$  min. Test the specimen for the appropriate property within a further  $(15 \pm 2)$  min.

### 4.3.3 Procedure for tests at elevated (40 °C) temperature

Place the shockpad test specimen in an air circulating oven conforming to ISO 188, at a temperature of  $(47,5 \pm 2,5)$  °C. After  $(120 \pm 5)$  min, remove the tests specimen from the oven. Place the test specimen on the test floor and allow it to cool. Monitor its temperature using a digital temperature probe inserted into the test specimen. When the temperature probe reads  $(42 \pm 0,5)$  °C, make a measure. Move the apparatus and repeat to obtain three results ensuring the temperature of the test specimen does not fall below 38 °C.

### 4.3.4 Procedure for tests at sub-ambient (5 °C) temperature

Place the shockpad test specimen in a conditioning cabinet at a temperature of  $-10$  °C to  $0$  °C. After  $(120 \pm 5)$  min, remove the tests specimen from the conditioning cabinet. Place the test specimen on the test floor and allow it to warm. Monitor its temperature using a temperature probe inserted into the test specimen. When the temperature gauge reads  $5$  °C, make a measure. Move the apparatus and repeat to obtain three results ensuring the temperature of the test specimen does not rise above  $7$  °C.

### 4.3.5 Procedure for accelerated air ageing

Following accelerated air ageing undertaken in accordance with EN 13817, the sample shall be tested under standard laboratory conditions.

### 4.3.6 Procedure for tests under freezing ( $-5$ °C) conditions

Immerse the shockpad in water to a depth of at least 10 mm above the top of the shockpad. After a minimum of one hour, remove the tests specimen from the water and place it on a free draining base to allow it to drain by gravity for  $(30 \pm 2)$  min before placing the test specimen in a conditioning cabinet at a temperature of  $-8$  °C to  $-12$  °C. After  $(240 \pm 5)$  min, remove the tests specimen from the conditioning cabinet. Place the test specimen on the test floor and allow it to warm. Monitor its temperature using a temperature probe inserted into the test specimen. When the temperature gauge reads  $-5^{\circ}\text{C} \pm 0,5$  °C, make a measurement. Move the apparatus and repeat to obtain three results ensuring the temperature of the test specimen does not rise above  $-3$  °C.

### 4.3.7 Test positions

Tests undertaken at  $(23 \pm 2)$  °C shall be made in three test locations, each 200 mm apart and at least 100mm from the sides of the test specimen.

For tests undertaken at non-ambient laboratory conditions one series of measurements shall be made at least 100 mm from the sides of the test specimen.

## 5 Load spreading plate

As a shockpad's performance can be influenced by the how an impact force is applied to it (e.g. a unrepresentative direct vertical loading can cause an excessive compression and loss of performance), certain tests (as specified in Clause 6) shall be made with and without a load spreading plate. The load spreading plate shall be as described in Table 2.

NOTE The load spreading plate is designed to part replicate in a standardized way the lateral impact dissipation provided by a playing surface laid over a shockpad.