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**Podloge za športne dejavnosti — Notranje podloge za večnamensko uporabo  
– Specifikacija**

Surfaces for sports areas - Specification for indoor surfaces for multi-sports use

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## Surfaces for sports areas - Specification for indoor surfaces for multi-sports use

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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## Foreword

This document (prEN 14904:2004) 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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

## 1 Scope

This European Standard specifies requirements for surfaces for indoor facilities for multi-sports use. It also covers surface systems which include both their supporting and upper layers whether produced *in situ* or prefabricated.

This European Standard is not applicable to indoor tennis halls.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 548, *Resilient floor coverings – Specification for plain and decorative linoleum*

EN 649, *Resilient floor coverings – Homogeneous and heterogeneous polyvinyl chloride floor coverings – Specification*

EN 650, *Resilient floor coverings – Polyvinyl chloride floor coverings on jute backing or on polyester felt backing or on polyester felt with polyvinyl chloride backing – Specification*

EN 651, *Resilient floor coverings – Polyvinyl chloride floor coverings with foam layer – Specification*

EN 652, *Resilient floor coverings – Polyvinyl chloride floor coverings with cork-based backing – Specification*

EN 653, *Resilient floor coverings – Expanded (cushioned) polyvinyl chloride floor coverings – Specification*

EN 654, *Resilient floor coverings – Semi-flexible polyvinyl chloride tiles – Specification*

EN 655, *Resilient floor coverings – Tiles of agglomerated composition cork with polyvinyl chloride wear layer – Specification*

EN 687, *Resilient floor coverings – Specification for plain and decorative linoleum on a corkment backing*

EN 1307, *Textile floor coverings – Classification of pile carpets*

EN 1470, *Textile floor coverings – Classification of needled floor coverings except for needled pile floor coverings*

EN 1516, *Surfaces for sports areas – Determination of resistance to indentation*

EN 1517, *Surfaces for sports areas – Determination of resistance to impact*

EN 1569, *Surfaces for sports areas – Determination of the behaviour under a rolling load*

EN 1816, *Resilient floor coverings – Specification for homogeneous and heterogeneous smooth rubber floor coverings with foam backing*

EN 1817, *Resilient floor coverings – Specification for homogeneous and heterogeneous smooth rubber floor coverings*

EN 12199, *Resilient floor coverings – Specifications for homogeneous and heterogeneous relief rubber floor*

EN 12235, *Surfaces for sports areas – Determination of vertical ball behaviour<sup>1)</sup>*

EN 13036-4, *Road and airfield surface characteristics – Test methods – Part 4: Method for measurement of slip/skid resistance of a surface – The pendulum test*

EN 13036-7, *Road and airfield surface characteristics – Test methods – Part 7: Irregularity measurement of pavement courses – The straightedge test*

EN 13238:2001, *Reaction to fire tests for building products – Conditioning procedures and general rules for selection of substrates*

EN 13297, *Textile floor coverings – Classification of needled pile floor coverings*

EN 13329, *Laminate floor coverings – Specifications, requirements and test methods*

EN 13501-1:2001, *Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests*

EN 13745, *Surfaces for sports areas – Determination of specular reflectance<sup>1)</sup>*

EN 14808, *Surfaces for sports areas – Determination of shock absorption<sup>1)</sup>*

EN 14809, *Surfaces for sports areas – Determination of vertical deformation<sup>1)</sup>*

EN 14837, *Surfaces for sports areas – Determination of slip resistance<sup>1)</sup>*

ENV 1997-1, *Eurocode 7: Geotechnical design – Part 1: General rules*

EN ISO 2813, *Paints and varnishes – Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°*

EN ISO 5470-1, *Rubber- or plastics-coated fabrics – Determination of abrasion resistance – Part 1: Taber abrader*

EN ISO 9001:2000, *Quality management systems – Requirements*

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1) To be published.

EN ISO 9239-1:2002, *Reaction to fire tests for floor coverings – Part 1: Determination of the burning behaviour using a radiant heat source*

EN ISO 11925-2:2002, *Reaction to fire tests for building products – Part 2: Ignitability when subject to direct impingement of flame*

ISO 1766, *Textile floor coverings – Determination of thickness*

ISO 11379, *Textile floor coverings – Laboratory cleaning process using spray extraction*

EN 14903, *Surfaces for sports areas – Determination of rotational resistance* <sup>1)</sup>

TS WI 217007, *Surfaces for sports areas – Determination of resistance to repeated impact* <sup>1)</sup>

TS WI 217XXX, *Surfaces for sports areas – Determination of energy restitution* <sup>1)</sup>

### 3 Terms and definitions

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

#### 3.1

##### **facilities for multi-sports use**

sports halls where more than one sport is played on the surface, e.g. handball, basketball, volleyball, five-a-side football, and which may also be used for physical education and other sporting activities

### 4 General requirements

NOTE The manufacturer and installer should take into account all relevant national legislation during the construction, operation and disposal of the surface and its supporting layers.

#### 4.1 Load-bearing capacity

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The formation and sub-soil shall have a load-bearing capacity capable of supporting the playing surface and normal maintenance requirements. No requirements are included in this European Standard for the construction of the base on which the multi-sports indoor surface is laid, but attention is drawn to the requirements given in ENV 1997-1.

NOTE Certain playing surfaces may be susceptible to damage by the playing or use of maintenance machinery and equipment on them, for example vehicles, temporary seating, etc..

#### 4.2 Information to be provided by the manufacturer

The manufacturer shall supply an assurance that the sports surface, together with its supporting layers,

- a) does not contain, in its finished state, any substance which is known to be toxic or carcinogenic when in contact with the skin and that no toxic or carcinogenic substance(s) will be released as a vapour or dust during normal use; and
- b) is dimensionally stable and that it will not undergo any curling of the edges of the surface or delamination of individual layers within the system where such multi-layered structures are used.

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1) To be published.

## 5 Requirements for safety in use

### 5.1 General introduction

Synthetic surfaces undergo a complex reaction when subjected to dynamic loading. The desired components of the interaction are compliance (deformation under load), the ability to absorb the impact, and the energy restitution of the impact, i.e. the amount of energy returned to a sports-person from the surface on which he/she is performing. The ability of a surface to absorb an impact is an important safety feature of a sports surface. Values specified are, therefore, inevitably a compromise between these fundamental characteristics. Sports surfaces react differently under different temperatures and strain rates; they become harder at low temperatures and softer at high temperatures.

An important requirement for safety and sports performance is for there to be sufficient grip between the footwear of the athlete and the sports surface. Insufficient grip may result in the athlete slipping on the surface; too much grip may place unacceptable stress on joints and muscle ligaments. Under wet conditions, a minimum friction value has to be ensured; under dry conditions, a maximum value has to be ensured. Therefore upper and lower limits for friction are specified (see 5.2).

Shock absorption (5.3) may be measured by the force reduction test (artificial athlete) as the reference method, although the accelerometric test (peak *g*) can also be used, both methods being described in prEN 14808. Correlation between these two test methods may either be calculated by a given formula or be looked up in a table/diagram.

No requirements are included in this European Standard for energy restitution, although a method by which this can be measured is described in prEN/TS WI 217XXX.

Information on resistance to repeated impact of synthetic floors is given in Annex A.

### 5.2 Friction

**NOTE** It is common practice throughout Europe to use different methods of test for measuring the surface friction/slip resistance of sports hall flooring. However, no correlation exists between the methods and, therefore, requirements are included based on results from each of the commonly used methods.

When tested by the method described in EN 13036-4 (Pendulum RRL method), prEN WI 217061 (Stuttgart method) or prEN 14837 (Le Roux method), as appropriate, the requirements shall be as given in Table 1.

**Table 1 — Requirements for friction**

Method	Requirement
prEN 14903	The friction coefficient shall be between 0,4 $\mu$ and 0,7 $\mu$
prEN 14837	The friction coefficient shall be between 0,6 $\mu$ and 0,8 $\mu$
prEN 13036-4	The mean of the Pendulum Test Value shall be between 80 and 110

### 5.3 Shock absorption

When tested by the method described in prEN 14808, the force reduction shall be between 25 % and 70 %.

**NOTE 1** These values are laboratory values. Measurements on site may be carried out at different temperatures and humidities depending on the ambient conditions of the sports hall, in which case the surface temperature and relative humidity should be recorded in the test report.

**NOTE 2** Information on shock absorption and vertical deformation classes for elastic floors is given in Annex B.



## 5.4 Vertical deformation

When tested by the method described in prEN 14809, the vertical deformation shall not exceed 5,0 mm for low loading surfaces or 8,0 mm for high loading surfaces.

NOTE 1 These values are laboratory values. Measurements on site may be carried out at different temperatures and humidities depending on the ambient conditions of the sports hall, in which case the surface temperature and relative humidity should be recorded in the test report.

NOTE 2 Information on shock absorption and vertical deformation classes for elastic floors is given in Annex B.

## 6 Technical requirements

### 6.1 Vertical ball behaviour

When tested by the method described in prEN 12235 using a basketball, the relative rebound height shall be at least 90 %.

### 6.2 Resistance to a rolling load

NOTE This property is important to ensure that the surface will not be damaged by equipment or seating that may be moved around on it.

When tested by the method described in EN 1569, the minimum resistance shall be 1500 N, the maximum indentation shall be 0,5 mm and no visible damage shall be observed after the test.

### 6.3 Resistance to wear

NOTE This property is important to ensure a reasonable expected lifetime in use, particularly for high usage areas (e.g. areas in front of goal on ball pitches, etc.) which are prone to loss of material by abrasion.

When tested by the method described in EN ISO 5470-1, using H18 wheels, the maximum loss in mass per 100 cycles shall be 3 000 mg for synthetic surfaces or 8 mg for wooden floor lacquers.

Linoleum floors need not be tested but shall be classified as class 33 in accordance with EN 548.

### 6.4 Reaction to fire

#### 6.4.1 Specimen preparation and conditioning

Preparation of test specimens shall be as defined in the appropriate fire test standard except that, in the case of textile floor coverings that contain fire retardants, a washing and cleaning procedure similar to that used in practice shall be carried out to verify the durability of surface fire retardant treatments (see 6.4.3).

The specimens shall be tested on one of the two standard substrates specified for floorings in EN 13238:2001, according to the intended end use.

The composition of the product, including the presence of any fire retardant additive (if applicable), shall be declared by the manufacturer prior to type testing.

#### 6.4.2 Application rules

If the specimens are tested using an adhesive, the test result is valid for the tested floor covering with that adhesive, or the generic adhesive type, in end use conditions.

If the specimens are tested without using an adhesive, the test result is valid for the tested floor covering with and without using adhesives in end use conditions.

#### **6.4.3 Durability aspects**

Where required, textile floor surfaces to be tested shall be subjected to the laboratory spray extraction cleaning procedure according to ISO 11379 with the following modifications.

- Clean the test specimens three times, with an interval of 2 hours  $\pm$  15 minutes between cycles, each cleaning cycle consisting of two strokes:
  - for the first stroke use the spray extraction machine with simultaneous spray and extraction,
  - for the second stroke operate the machine only as an extraction machine.
- Carry out the first cleaning cycle using the reference cleaning solution at ambient temperature ( $25\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$ ) and the second and third cleaning cycle with water at ambient temperature without any addition of chemicals.

#### **6.4.4 Classification**

If a claim for reaction to fire performance is made, the floor covering (except as provided for below) shall be tested and classified according to the requirements of EN 13501-1:2001 and the resulting class and subclass shall be declared.

If it is decided to make no claim for reaction to fire performance, i.e. it is decided to place a product or family of products on the market as class Ffl, no testing is required for this product or family of products.

The products listed in Tables 2, 3 and 4, of known and stable performance which do not contain added fire retardants, constitute a group of stable products with a given reaction to fire class and do not require testing.

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