



SLOVENSKI STANDARD
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**Podloge za športne dejavnosti - Notranje podloge za večnamensko uporabo -
Specifikacija**

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

Sportböden - Mehrzweck-Sporthallenböden - Anforderungen

Sols sportifs - Sols multi-sports intérieurs - Spécification

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

Sols sportifs - Sols multi-sports intérieurs - Spécification

Sportböden - Mehrzweck-Sporthallenböden -
Anforderungen

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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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (prEN 14904:2014) 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.

This document will supersede EN 14904:2006.

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.

The following significant technical changes have been implemented in this new edition:

- New terminology of the CPR
- *EoC* is changed in *Assessment and verification of constancy of performance – AVCP*
- *DOP* (New clause)
- *ITT* is changed in *Product Type determination*

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1 Scope

This European Standard specifies requirements for multi-sports surfaces designed for use in indoor sport halls and gymnasia and used for example one or more of the following sports: volleyball, basketball, badminton, small sided football, handball, physical education....

It provides for the evaluation of conformity of products, which include their upper (playing) surface and supporting layers, whether prefabricated or constructed *in situ* or a combination of the two.

This European Standard does not apply to synthetic turf or textile surfaces used indoors.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 717-1, *Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method*

EN 717-2, *Wood-based panels - Determination of formaldehyde release - Part 2: Formaldehyde release by the gas analysis method*

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 12235, *Surfaces for sports areas - Determination of vertical ball behaviour*

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

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

EN 13501-1, *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*

EN 14808, *Surfaces for sports areas - Determination of shock absorption*

EN 14809, *Surfaces for sports areas - Determination of vertical deformation*

EN 14903, *Surfaces for sport areas – Determination of rotational friction*

EN ISO 2813, *Paints and varnishes - Determination of specular gloss of non-metallic paint films at 20°, 60° and 85° (ISO 2813:1994, including Technical Corrigendum 1:1997)*

EN ISO 5470-1, *Rubber- or plastics-coated fabrics - Determination of abrasion resistance - Part 1: Taber abrader (ISO 5470-1:1999)*

ISO 1957, *Machine-made textile floor coverings — Selection and cutting of specimens for physical tests*

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3 Terms and definitions **(standards.iteh.ai)**

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

3.1

Sport floor system

Sport floor surface

Sport floor

combination of all elements of the construction that influence the sportive dynamic properties of the floor

3.2

Sport floor covering

the top playing layer

3.3

Sub-construction

combination of elements which give no sportive properties

3.4

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

3.5

area-elastic sports floor

sports floor systems, to which the application of a point force causes deflection over a relatively large area around the point of application of the force

3.6

point-elastic sports floor

sports floor systems, to which the application of a point force causes deflection only at or close to the point of application of the force

3.7

combined-elastic sports floor

area-elastic sports floor systems with a point-elastic top layer, to which the application of a point force causes both localized deflection and deflection over a wider area

3.8**mixed-elastic sports floor**

point-elastic sports floor systems with a synthetic area-stiffening component

4 Characteristic of installation

A technical datasheet, installation guide and a maintenance instruction for the sports floor has to be handed over from the producer of the sports floor to ensure that the system can get installed and maintained properly and to guarantee the essential characteristics declared.

5 Essential characteristics**5.1 Reaction to fire****5.1.1 Specimen preparation and conditioning**

Preparation of test specimens shall be as defined in the appropriate fire test standard.

The specimens shall be tested on one of the two standard substrates specified for floorings in EN 13238, 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.

Prior to type testing the manufacturer shall declare the relevant composition of the product, including the presence of any fire retardant additive (if applicable) to the relevant notified body.

5.1.2 Application rules

For point-elastic and mixed-elastic sport floors the whole system should be tested on the standard substrates for floorings defined in EN 13238 according to their intended use.

For area-elastic and combined elastic sports floors, the top layer, the load distribution plate and the elastic layer (or the sleeper layer when applicable) should be tested.

EN 9239-1 equipment could be modified in order to test floors with a thickness up to 55 mm. If the assembly of the top layer with the load distribution plate and the elastic layer (or the sleeper layer when applicable) exceeds 55 mm, it is possible to test specimens with a thickness inferior or equal to 55 mm. In this case, the specimens tested should be representative of the fire behaviour of the assembly of these three layers.

If the specimens are tested on the combustible substrate (not fire retardant treated particleboard) for floorings specified in EN 13238, the test result is also valid on the non-combustible (fibre cement board) specified in EN 13238.

NOTE 1 the reason is that the use of a non-combustible substrate will provide an improvement to the fire behaviour of the sport floor.

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

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

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NOTE 2 The reason is that the use of an adhesive will provide an improvement to the fire behaviour of the sport floor

5.1.3 Classification

If a claim for reaction to fire performance is made, the sports floor shall be tested and classified according to the requirements of EN 13501-1 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 F_{fl}, no testing is required for this product or family of products.

The products listed in Tables 1, 2 and 3, in the end uses identified in the tables, are classified without further testing (CWFT) in the classes shown and do not require testing in respect of these end uses and classes.

NOTE The provisions of Tables 1, 2 and 3 are subject to final approval by the Standing Committee for Construction. Users of this standard should, therefore, refer to the published EC Decisions, when they become available, to verify the details. Any changes necessary to these standards will be published in a Corrigendum.

Table 1 — Classes of reaction to fire for laminate floor coverings, classified without further testing

Floor covering type ^{a, g}	Product detail ^d	Minimum density (kg/m ³) ^e	Minimum overall thickness (mm)	End use condition	Class ^c Floorings
Wood flooring and parquet	Solid flooring of oak or beech with surface coating	Beech: 680 Oak: 650	8	Glued to substrate	Cfl - s1
	Solid flooring of oak, beech or spruce and with surface coating	Beech: 680 Oak: 650 Spruce: 450	20	With or without air gap underneath	Dfl - s1
	Solid wood flooring with surface coating and not specified above	390	8	Without air gap underneath	
		390	20	With or without air gap underneath	
	Solid wood flooring and parquet not specified above	400	6	All	Efl
Wood parquet	Multilayer parquet with a top layer of oak of at least 5 mm thickness and with surface coating	650 (top layer)	10	Glued to substrate	C _{fl} - s1
			14	With or without air gap underneath	
	Multilayer parquet with surface coating and not specified above	500	8	Glued to substrate	Dfl - s1
			10	Without air gap underneath	
			14 ^b	With or without air gap underneath	

Floor covering type ^{a, g}	Product detail ^d	Minimum density (kg/m ³) ^e	Minimum overall thickness (mm)	End use condition	Class ^c Floorings
	Solid wood (one layer) parquet of walnut	650	8	Glued to substrate ^j	D _{fl} -s1
	Solid (one layer) parquet of oak, maple and ash	Ash:650 Maple: 650 Oak: 720	8	Glued to substrate ^f	D _{fl} -s1
	Multilayer parquet with oak top layer, at least 3,5 mm	550	15 ^h	Without air gap underneath	D _{fl} -s1
Wood flooring	Solid wood flooring of pine and spruce	Pine: 480 Spruce: 400	14 ^b	Without air gap underneath	D _{fl} -s1
	Solid flooring of beech, oak, pine or spruce ⁱ	Beech: 700 Oak: 700 Pine: 430 Spruce: 400	20	With or without air gap underneath	D _{fl} -s1
Veneered floor covering	Veneered floor covering with surface coating	800	6 ^b	Without air gap underneath	D _{fl} - s1

^a Mounted in accordance with EN ISO 9239-1, on a substrate of at least Class D - s2, d0 and with minimum density of 400 kg/m³ or with an air gap underneath.

^b An interlayer of at least Class E and with maximum thickness 3 mm may be included in applications without an air gap, for parquet products with 14 mm thickness or more and for veneered floor coverings.

^c Class as provided for in Commission Decision 2000/147/EC Annex Table 2.

^d Type and quantity of surface coatings included are acrylic, polyurethane or soap, 50–100 g/m², and oil, 20–60 g/m².

^e Conditioned according to EN 13238 (50 % RH 23 oC).

^f Substrate at least Class A2 - s1, d0.

^g Applies also to steps of stairs.

^h An interlayer of at least Class E_{fl} and with maximum thickness 3 mm and minimum density of 280 kg/m³ may be included.

ⁱ Without surface coatings.

^j Substrate at least Class D-s2,d0.

Table 2 — Classes of reaction to fire for resilient floor coverings, classified without further testing

Floor covering type ^a	EN product standard	Minimum mass (kg/m ²)	Maximum mass (kg/m ²)	Minimum overall thickness (mm)	Class ^b Flooring
Plain and decorative Linoleum	EN 548	2,3	4,9	2	E _{fl}
Homogeneous and heterogeneous polyvinyl	EN 649	2,3	3,9	1,5	E _{fl}

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Floor covering type ^a	EN product standard	Minimum mass (kg/m ²)	Maximum mass (kg/m ²)	Minimum overall thickness (mm)	Class ^b Flooring
chloride floor coverings					
Polyvinyl chloride floor coverings with foam layer	EN 651	1,7	5,4	2	E _{fl}
Polyvinyl chloride floor covering with cork-based backing	EN 652	3,4	3,7	3,2	E _{fl}
Expanded (cushioned) polyvinyl chloride floor coverings	EN 653	1,0	2,8	1,1	E _{fl}
Semi-flexible polyvinyl chloride tiles	EN 654	4,2	5,0	2	E _{fl}
Linoleum on corkment backing	EN 687	2,9	5,3	2,5	E _{fl}
Homogeneous and heterogeneous smooth rubber floor coverings with foam backing	EN 1816	3,4	4,3	4	E _{fl}
Homogeneous and heterogeneous smooth rubber floor coverings	EN 1817	3,0	6,0	1,8	E _{fl}
Homogeneous and heterogeneous relief rubber floor coverings	EN 12199	4,6	6,7	2,5	E _{fl}

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^a Floor covering loose laid over any wood based substrate of at least Class D-s2,d0 or any substrate of at least Class A2-s1,d0.

^b Class as provided for in Table 2 in the Annex to Decision 2000/147/EC.

5.1.4 Product parameters influencing reaction to fire performance

The product parameters shown in Table 4 influence the reaction to fire performance of sports floor systems and this table shall be followed if testing a range of products.

Table 3 — Product parameters influencing reaction to fire performance of indoor sports floor systems

Parameters	Comments
Composition	Each sports floor system with different composition, build-up or surface layer shall be tested separately.
Thickness	If a sports floor system is produced with a range of different nominal thicknesses, this shall be considered when testing. At least the minimum and maximum thickness shall be tested (one individual indicative test each) and for the worst case a complete series of tests shall be carried out. The worst case determines the classification.
Mass per unit area or density	If a sports floor system is produced with a range of different nominal masses per unit area or densities, this shall be considered when testing. At least the minimum and maximum masses per unit area or densities shall be tested (one individual indicative test each) and for the worst case a complete series of tests shall be carried out. The worst case determines the classification.

Surface structure	If a sports floor system is produced with several different surface structures and it is assumed that this will influence the fire performance, this shall be considered when testing. Each surface structure shall be tested (one classification each). The worst case determines the classification.
Colour and design	Colour and design of a sports floor system have no effect on the reaction to fire behaviour unless different colours and designs change the composition or other parameters as mentioned above.

5.2 Emission of formaldehyde

When formaldehyde-containing materials have been added to the sport floor covering as a part of the production process, the product shall be tested and classified into one of two classes: E1 or E2, as specified in Table 2 and Table 3.

NOTE Products of Class E1 can be used without causing an indoor air concentration greater than $0,1 \times 10^{-6}$ mg/kg (0,1 ppm) of formaldehyde.

The test requirement does not apply to sport floor covering to which no formaldehyde-containing materials were added during production or post-production processing. These need not be classified, but may, without any testing, be declared as Class E1.

Table 4 — Formaldehyde Class E1

	Test method	Requirement
Initial type testing^a	EN 717-1	Release $\leq 0,12$ mg/m ³
Factory production control	EN 717-1	Release $\leq 0,12$ mg/m ³
	EN 717-2	Release $\leq 3,5$ mg/m ² h
^a For established products, initial type testing may also be carried out on the basis of existing data with EN 717-2 testing, either from factory production control or from external inspection.		

Table 5 — Formaldehyde Class E2

	Test method	Requirement
Determination of the product-type on the basis of type testing	EN 717-1	Release $> 0,12$ mg/m ³
	EN 717-2	Release $> 3,5$ mg/m ² h to ≤ 8 mg/m ² h
Factory production control	EN 717-1	Release $> 0,12$ mg/m ³
	EN 717-2	Release $> 3,5$ mg/m ² h to ≤ 8 mg/m ² h

5.3 Emission of pentachlorophenol

Sport floor covering shall not contain pentachlorophenol or a derivative thereof as a component in the production process of the product or of its raw materials. In cases where verification is required, if the content is less than 5 ppm by mass by the method described in Annex D, this requirement shall be considered to be met.

5.4 Release of other dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>

prEN 14904:2014 (E)**5.5 Linear friction**

When tested by the method 1 described in EN (WI 00217098) using CEN rubber under dry conditions at a temperature of (23 ± 2) °C, the sports floor covering shall have a coefficient of friction between 80 and 115

5.6 Shock absorption

When tested by the method described in EN 14808, carrying out a minimum of four tests plus one test for every 500 m² of area, the mean shock absorption of the sport floor system shall be between 25 % and 75 % and no individual result shall differ from the mean by more than ± 5 units.

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 typical shock absorption and vertical deformation values for sport floor systems is given in Annex B.

5.7 Resistance to rolling load

When tested by the method described in EN 1569, sports floor systems shall have a minimum resistance of 1500 N, the maximum indentation shall be 0,5 mm under a 300 mm straight edge and no perceivable damage shall be observed after the test.

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

5.8 Resistance to wear

For synthetic sport floor systems, when tested by the method described in EN ISO 5470-1, using H18 wheels with a 1 kg load, the maximum loss in mass per 1.000 cycles shall be 1.000 mg

For lacquers intended to be applied as part of scheduled maintenance, when tested by the method described in EN ISO 5470-1, using CS10 wheels with a 500 g load, the maximum loss in mass per 1 000 cycles shall be 80 mg.

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) which are prone to loss of material by abrasion.

6 Other characteristics**6.1 General**

XXXXXXXXXXXXX

6.2 Vertical ball behaviour

When tested by the method described in EN 12235 using a basketball, sports floor systems shall have a relative rebound height ≥ 90 % of the rebound height on concrete.

6.3 Vertical deformation

When tested by the method described in EN 14809, the vertical deformation of sport floor systems shall not exceed 5,0 mm.

NOTE 1 These values are laboratory values. Measurements on site may be carried out at different temperatures and humidity 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 typical shock absorption and vertical deformation values for sports floor systems is given in Annex B.

6.4 Specular reflectance

Where required, the specular reflectance of the sport floor covering shall be measured using the method described in EN 13745, using an angle of 85°, and the mean value obtained shall be reported.

6.5 Specular gloss

When tested by the method described in EN ISO 2813 using an angle of incidence of 85°, matt sport floor coverings shall have a specular gloss ≤ 30 % and lacquered sport floor coverings a specular gloss ≤ 45 %.

6.6 Resistance to indentation

When tested by the method described in EN 1516, the mean residual indentation of the sport floor covering, measured 5 min after removal of the load, shall be reported and the mean residual indentation measured 24 h after removal of the load shall be $\leq 0,5$ mm.

For area-elastic sports floors, test only the upper layer supported on a rigid structure.

6.7 Resistance to impact

After conditioning for 14 days at a temperature of (50 ± 1) °C or (70 ± 1) °C and then testing by the method described in EN 1517 at a test temperature of (10 ± 1) °C using an indenter with a mass of 800 g, there shall be perceivable cracking, splitting, delamination or permanent indentation of the test piece except for wood sport floors for which the indentation shall not exceed 0,5 mm.

For combined-elastic sport floor systems:

- - ageing of the point elastic component only.
- - to be tested either on the supporting area elastic system or on a rigid floor.

For area-elastic sport floor systems:

- - ageing of the sports floor covering only.
- - to be tested either on the supporting area elastic system or on a rigid floor
- For parquet:
- the whole system shall be tested without ageing at a temperature of 23 ± 2 °C.

Two classes are set up:

Class A: temperature of the conditioning is 50°C

Class B: temperature of the conditioning is 70°C

The choice of the class is the decision of the manufacturer.

NOTE Information on resistance to repeated impact of synthetic floors is given in Annex I

7 Positioning of test apparatus on sample

The position of the system testing spots (at least 5) is depending on the appropriate sports floor construction and should cover all constructive elements. The positions fixed should be described by wording and for area elastic and