EN 14904

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www.descol.nl
Co-operation between European test institutes and standardization institutes formalized in 1961

Construction under CEN "Committee for European Normalisation" based in Brussels

1985 introduction of EU mandates to CEN for development of harmonised test methods and standards

In 2005 over 11,000 standards published
CEN General Assembly, Administrative Board and Technical Board responsible for all formalities and progress in execution of mandates

Stand still in development of national standards once EU mandate is given to CEN

Members obliged to follow EN standards once Published

All EN standards are based on performance criteria for the user versus product/system driven
Publications endorsed by Technical Committees
(Sports is TC 217)

Publications written by Working Groups
(Indoor Multipurpose is WG 2)

Participants: national standardization bodies, institutes, industry

EN standards are divided in two parts: 1 for safety according to the EU Construction Products Directive (CE Marking) and 1 for technical requirements
EN standards can comprise of mandatory and voluntary sub standards; EN xxxx or ENV xxxx

Harmonised test methods are mandatory, performance standards can be a range so individual buyers (countries) can set their own desired performance level within the range

EN standards typically contain some general environmental and safety requirements
In order to be fully certified products need to fulfill requirements in initial laboratory type testing and fulfill continuous Factory Production Control requirements.

Products meeting the essential characteristics are allowed to use the CE marking:

- Friction
- Durability
- Reaction to Fire
- Shock absorbency
- Release of dangerous substances
Norm content:

- Definitions
- Test Methods
- Requirements
- Certification Procedures
- Informative Annexes
Definitions: Point-elastic floor

Applying a point force causes deflection only at or close to the point of application of the force
Definitions: Area-elastic floor

Applying a point force causes deflection over a relatively large area around the point of application of the force.
Definitions: Combi-elastic floor

An area-elastic floor with a point-elastic top layer. Applying a point force causes both localised deflection and deflection over a wider area.
Definitions: Mixed-elastic floor

A point-elastic floor with an area-stiffening component. The floor has deflection characteristics between those of an area-elastic floor and a point-elastic floor.
Requirements for safety in use

- Friction
  - Skid resistance test using a CEN rubber
  - Pendulum Test Value
  - Value between 80 and 110
Requirements for safety in use

- Shock absorption

  - A minimum of four tests plus one test for every 500 m² (5,380 SFt) of floor area
  - Mass falling weight = 20 +/- 0.1 Kg (44.1 Pds)
  - Force reduction between 25% and 75%
Requirements for safety in use

Typical values of force reduction (%)  

<table>
<thead>
<tr>
<th>Type</th>
<th>Point</th>
<th>Mixed</th>
<th>Area</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>≥25 &lt;35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>≥35 &lt;45</td>
<td>≥45 &lt;55</td>
<td>≥40 &lt;55</td>
<td>≥45 &lt;55</td>
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<td>≥45</td>
<td>≥45 &lt;55</td>
<td>≥40 &lt;55</td>
<td>≥45 &lt;55</td>
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<tr>
<td>4</td>
<td>≥55 &lt;75</td>
<td>≥55 &lt;75</td>
<td>≥55 &lt;75</td>
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</tbody>
</table>
Requirements for safety in use

- Vertical deformation
  - shall not exceed 5,0 mm
- Artificial athlete
- Mass falling weight = 20 +/- 0,1 kg.
Requirements for safety in use

Typical values of vertical deformation (mm)  Annex B

<table>
<thead>
<tr>
<th>Type</th>
<th>Point</th>
<th>Mixed</th>
<th>Area</th>
<th>Combined</th>
<th>$V_{D_p}$</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$\leq 2,0$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$\leq 3,0$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$\leq 3,5$</td>
<td>$\leq 3,5$</td>
<td>$\geq 1,8 &lt;3,5$</td>
<td>$\geq 1,8 &lt;5,0$</td>
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</tr>
<tr>
<td>4</td>
<td>$\leq 3,5$</td>
<td></td>
<td>$\geq 2,3 &lt;5,0$</td>
<td>$\geq 2,3 &lt;5,0$</td>
<td>$\geq 0,5 &lt;2,0^a$</td>
</tr>
</tbody>
</table>

$V_{D_p}$ is the vertical deformation of the point-elastic component.
Technical Requirements

- User Performance Requirements
- Durability Requirements
- General Construction Requirements
User Performance Requirements

- Vertical ball behaviour
- Specular reflectance
- Specular gloss
- Degree of evenness

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User Performance Requirements

- Vertical ball behaviour
  - using a standard basketball
  - dropheight 1,80 m
  - the relative rebound height should be $\geq 90\%$ of the rebound height on concrete
User Performance Requirements

- Specular reflectance
  - using an angle of 85°
  - mean value obtained shall be reported

- Specular gloss
  - an angle of incidence of 85°
  - specular gloss shall be ≤ 30 for matt surfaces and ≤ 45 for lacquered surfaces.
User Performance Requirements

➢ Degree of evenness

- measured on site
- the greatest distance between the straight edge and the sports surface shall not exceed 2 mm over a measuring distance of 0.3 m and shall not exceed 6 mm over a measuring distance of 3 m.

EN 13036-7
Durability Requirements

- Resistance to a rolling load
- Resistance to wear
- Resistance to indentation
- Resistance to impact

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Durability Requirements

- Resistance to a rolling load
  - the minimum resistance shall be 1,500 N (337 Pds)
  - maximum indentation: 0,5 mm under a 300 mm (1 Ft) straight edge
  - recovery time between 15 min and 20 min
Durability Requirements

➢ Resistance to wear

- Taber test
- using H18 wheels with a 1 Kg (2.2 Pds) load
- maximum loss per 1,000 cycles is 1,000 mg
Durability Requirements

➢ Resistance to wear

Maintenance Coatings and Lacquers:
- Taber test using CS10 wheels with a 0,5 Kg (1,1 Pds) load
- maximum loss per 1,000 cycles is 80 mg

EN ISO 5470-1
Durability Requirements

- Resistance to indentation
  - the mean indentation 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 ≤0,5 mm.
Durability Requirements

- Resistance to impact

  - Conditions: 14 days at $T = 50 \pm 1 \, ^\circ C$ (122 F)
    
    Test $T = 10 \pm 1 \, ^\circ C$ (50 F)
    
    Mass = 800 g (1.76 Pds)

  - After testing no perceivable cracking, splitting, delamination or permanent indentation of the test piece
General Construction Requirements

- Reaction to fire
- Formaldehyde emission
- Content of pentaclorophenol
General Construction Requirements

- Reaction to fire
  - 2 Classifications:
    - Construction products, excluding floorings
    - Floorings ($f_l$ criteria)
  - Classification for flooring contains 6 Classes:
    - Class $F_{fl}$ up to Class $A_{fl}$
  - Tests for Burning Behaviour (spread of flames) with radiant panel and for Ignitability
General Construction Requirements

- **Smoke production**
  - s1: Smoke $\leq 750\% \times$ minutes
  - s2: Products not satisfying the class 1 criterion

- **Classification required for all products that claim reaction to fire in class D_{fl}, C_{fl}, B_{fl} or A2_{fl}**.
General Construction Requirements

- Formaldehyde emission
  - 2 classifications: E1 and E2
  - If no formaldehyde-containing materials are added during production or post-production processing: Class E1.
General Construction Requirements

- Content pentachlorophenol (PCP)
  - Sports floor coverings 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 0,1% by mass this requirement shall be considered to be met.
Conformity

The conformity of a sports floor covering with the requirements of this European Standard (including classes) shall be demonstrated by:

- initial type testing
- factory production control (FPC)
Conformity

- Factory Production Control (FPC)
  - control of raw material
  - process control
  - calibration plan
  - testing of finished products
  - traceability

A manufacturer applying EN ISO 9001:2000 made specific to the requirements of this standard is deemed to satisfy the FPC requirements.
CE Marking and Labelling

- Marking products conform European Standard
  - number and year of the European Standard (EN 14904:2006)
  - manufacturer’s or supplier’s identification
  - product name and batch number
- National standards will have to be replaced by the EN 14904 now it is officially published.

- EN 14904 is officially published in April 2006

- English version available through BSI
  
  www.bsi-global.com
  cservices@bsi-global.com
  +44 20 8996 9000
➢ National requirements have to be within EN 14904 range if the topic is addressed in the EN standard. Different countries can use different requirements within the range.

➢ Individual countries can enforce additional requirements for topics not covered by the standard.
Individual buyers can specify required minimum performance levels within the range.

Non compliance with the standard is only allowed if enforced by national legislation.

Individual buyers can ask for additional certification, e.g. Sports Governing Bodies (FIBA, IHF, etc) or National Institutions (Marque NF, ISA Keur, DIN / RAL Guteüberwachung, etc.)
Thank you for your attention!

Any questions / remarks?