

SVENSK STANDARD

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**Surfaces for sports areas – Synthetic turf and needle-punched
surfaces primarily designed for outdoor use –
Part 2: Specification for needle-punched surfaces for tennis and
multi-sport surfaces**



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Denna standard ersätter SS-EN 15330-2:2008, utgåva 1.

The European Standard EN 15330-2:2017 has the status of a Swedish Standard. This document contains the official version of EN 15330-2:2017.

This standard supersedes the Swedish Standard SS-EN 15330-2:2008, edition 1.

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EUROPEAN STANDARD

EN 15330-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2017

ICS 97.220.10

Supersedes EN 15330-2:2008

English Version

Surfaces for sports areas - Synthetic turf and needle-punched surfaces primarily designed for outdoor use -
Part 2: Specification for needle-punched surfaces for
tennis and multi-sport surfaces

Sols sportifs - Surfaces en gazon synthétique et surfaces en textile aiguilleté principalement destinées à l'usage en extérieur - Partie 2: Spécifications relatives aux surfaces en textile aiguilleté destinées à la pratique du tennis ou à un usage multisports

Sportböden - Überwiegend für den Außenbereich hergestellte Kunststoffrasenflächen und Nadelfilze - Teil 2: Festlegungen für Nadelfilze für Tennis und für multifunktionale Beläge

This European Standard was approved by CEN on 17 April 2017.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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European foreword

This document (EN 15330-2:2017) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports areas”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2018, and conflicting national standards shall be withdrawn at the latest by January 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15330-2:2008.

The main technical change compared to EN 15330-2:2008 is the incorporation of a specific way of mounting test specimens for the resistance of artificial weathering test that is designed to improve the reproducibility of the test when the fibres used to make needle-punch carpets are tested.

EN 15330 consists of the following parts, under the general title *Surfaces for sports areas — Synthetic turf and needle-punched surfaces primarily designed for outdoor use*:

- *Part 1: Specification for synthetic turf surfaces for football, hockey, rugby union training, tennis and multi-sport use*
- *Part 2: Specification for needle-punched surfaces for tennis and multi-sport surfaces*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

SS-EN 15330-2:2017 (E)**1 Scope**

This European Standard specifies performance and durability characteristics of needle-punched sports surfaces primarily used outdoors. Two categories of surfaces are covered, based on the principal sporting use of the surface, as follows:

- surfaces designed for multi sports use, and
- surfaces designed primarily for tennis.

The requirements are intended to apply to surfaces used for community, educational and recreational sport. For professional and elite levels of competition, many sports governing bodies have published their own specifications; the requirements of the sports' governing bodies might differ from those detailed in this European Standard and facility developers are advised to ensure that they select surfaces offering the correct levels of performance for the levels of competition to be played on the pitch or court.

This European Standard is based on type approval testing of products in the laboratory. Selected requirements may also be used on site to assess the suitability of installed surfaces.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 993-1, *Methods of test for dense shaped refractory products — Part 1: Determination of bulk density, apparent porosity and true porosity*

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

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

EN 12228, *Surfaces for sports areas — Determination of joint strength of synthetic surfaces*

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

EN 12234, *Surfaces for sports areas — Determination of ball roll behaviour*

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

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

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

EN 13672, *Surfaces for sports areas — Determination of resistance to abrasion of non-filled synthetic turf*

EN 13744, *Surfaces for sports areas — Procedure for accelerated ageing by immersion in hot water*

EN 13865, *Surfaces for sports areas — Determination of angled ball behaviour — Tennis*

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

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

EN 14836, *Synthetic surfaces for outdoor sports areas — Exposure to artificial weathering*

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

EN 15301-1, *Surfaces for sports areas — Part 1: Determination of rotational resistance*

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

EN ISO 2082, *Metallic and other inorganic coatings — Electroplated coatings of cadmium with supplementary treatments on iron or steel (ISO 2082)*

EN ISO 5079, *Textiles — Fibres — Determination of breaking force and elongation at break of individual fibres (ISO 5079)*

EN ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization (ISO 11357-3)*

EN ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1)*

ISO 1766, *Textile floor coverings — Determination of thickness of pile above the substrate*

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

3 Terms and definitions

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

3.1

non filled needle-punched surface

needle-punched or fibre bonded surface that does not contain any form of unbound particulate fill within the pile of the carpet

3.2

filled needle-punched surface

needle-punched or fibre bonded surface whose pile is either totally filled or partly filled with an unbound particulate material (typically sand)

3.3

surface for multi sports

needle-punched or fibre bonded surface designed to be used for more than one sport

4 Laboratory type approval

4.1 General

When tested in the laboratory, the needle-punched surface shall conform to the following requirements.

SS-EN 15330-2:2017 (E)**4.2 Material tests****4.2.1 Tensile properties of a needle-punched carpet**

When tested in accordance with EN ISO 13934-1, the maximum force shall be greater than 7,5 N/mm (375 N on a 50 mm tests specimen).

4.2.2 Resistance to artificial weathering**4.2.2.1 Tensile strength of fibres**

When tested in accordance with EN ISO 5079, but at a laboratory temperature of (23 ± 2) °C following artificial weathering in accordance with EN 14836; modified as detailed in Annex C, the tensile strength of the fibres used to form the pile of the needle-punched surface shall be within 50 % of the tensile strength of the unaged fibres.

NOTE Refer to Annex C for the correct mounting and wetting procedures of the fibres to EN 14836.

4.2.2.2 Colour fastness

When tested in accordance with EN 20105-A02 following artificial weathering in accordance with EN 14836, the change in colour of the weathered needle-punched surface compared to an unaged test specimen of the needle-punched surface shall be Grey Scale 3 or greater.

4.2.3 Bonded Joint Strength

When tested in accordance with Method 2 of EN 12228, following immersion in hot water in accordance with EN 13744, the strength of bonded joints shall be a minimum of 60 N/100 mm unaged and 75 % of the unaged value after ageing and more than 60 N/100 mm.

4.2.4 Abrasion resistance**4.2.4.1 Non filled surfaces**

When tested in accordance with EN 13672, the percentage mass loss after 2 000 cycles shall be equal to or less than 2 %.

4.2.4.2 Filled surfaces

When tested in accordance with EN 13672, but modified so that each wheel is acting under a load of 250 g, the percentage mass loss after 2 000 cycles shall be equal to or less than 2 %.

4.2.5 Water permeability

When tested in accordance with EN 12616, the water infiltration rate of surfaces designed to be permeable shall be equal to or greater than 500 mm/h.

4.3 Surfaces designed for multi sports use**4.3.1 General**

Needle-punched surfaces designed for multi sports use shall conform to the requirements given in 4.2 and 4.3.2 to 4.3.6.

Test pieces shall be prepared in accordance with EN 12229 and with the manufacturer's instructions prior to testing.

Wet test pieces shall be prepared in accordance with the procedure given in Annex A.

4.3.2 Vertical ball rebound

4.3.2.1 General

The surface shall conform to the requirements given in 4.3.2.2, 4.3.2.3 or 4.3.2.4, as appropriate, depending on the sports to be played on the surface.

4.3.2.2 Football

When tested in accordance with EN 12235 using a football under both dry and wet conditions, the vertical ball rebound shall be between 45 % and 90 % (0,60 m and 1,22 m).

4.3.2.3 Hockey

When tested in accordance with EN 12235 using a hockey ball under both dry and wet conditions, the vertical ball rebound shall be less than 90 % (0,58 m).

4.3.2.4 Tennis

When tested in accordance with EN 12235 using a tennis ball under both dry and wet conditions, the vertical ball rebound shall be greater than 80 % (1,12 m).

4.3.3 Ball roll and velocity change

When tested in accordance with EN 12234 using a hockey ball under both dry and wet conditions, the ball roll shall be between 5,0 m and 15,0 m.

When tested in accordance with EN 12234 using a football under both dry and wet conditions, the velocity change shall be between 0,10 m/s and 0,75 m/s.

4.3.4 Shock absorption

When tested in accordance with EN 14808 under both dry and wet conditions, the shock absorption shall be classified as in Table 1.

Table 1 — Classification of shock absorption for multi sports surfaces

Force reduction (%)	Classification
< 15	SANP 1
15 to 29	SANP 2
30 to 44	SANP 3
> 45	SANP 4
NOTE 1 If tennis is to be played, the shock absorption will typically be Class SANP 1. NOTE 2 For general sports training (non-contact) and physical education, the shock absorption will typically be Class SANP 2 or SANP 3. NOTE 3 If hockey is the priority sport or general sports training (contact) is to be undertaken, the shock absorption will typically be Class SANP 3 or SANP 4. NOTE 4 If football is to be played, the shock absorption will typically be Class SANP 4.	

4.3.5 Rotational resistance

When tested in accordance with EN 15301-1, using the dimpled rubber test foot under both dry and wet conditions, the rotational resistance shall be between 25 Nm and 50 Nm.