SLOVENSKI STANDARD
oSIST prEN 14716:2014

01-december-2014

Napeti stropovi - Zahteve in preskusne metode

Stretched ceilings - Requirements and test methods

Spanndecken - Anforderungen und Prüfverfahren

Plafonds tendus - Exigences et méthodes d'essai

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Ta slovenski standard je istoveten z: **prEN 14716**

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ICS:

91.060.30 Stropi. Tla. Stopnice Ceilings. Floors. Stairs

oSIST prEN 14716:2014 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 14716

October 2014

ICS 91.060.30

Will supersede EN 14716:2004

English Version

Stretched ceilings - Requirements and test methods

Plafonds tendus - Exigences et méthodes d'essai

Spanndecken - Anforderungen und Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 357.

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

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Ref. No. prEN 14716:2014 E

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Foreword

This document (prEN 14716:2014) has been prepared by Technical Committee CEN/TC 357 “Stretched ceilings”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14716:2004.

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.

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1 Scope

This document specifies the characteristics, specifications and test methods for stretched ceilings made up of single or multi-layer sheets, coated fabrics or fabrics made up of coated or monofilament yarn with a fastening system intended for internal finishes of ceilings.

It also specifies the method of conformity assessment for stretched ceilings.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for 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 71-3, *Safety of toys - Part 3: Migration of certain elements*

EN 1875-3, *Rubber- or plastics-coated fabrics - Determination of tear strength. Part 3: Trapezoidal method.*

EN 12149, *Wallcoverings in roll form - Determination of migration of heavy metals and certain other elements, of vinyl chloride monomer and of formaldehyde release*

EN 12280-1, *Rubber- or plastic- coated fabrics - Accelerated ageing tests - Part 1: Heat ageing*

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

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

EN 13823, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item*

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EN ISO 105-B02, *Textiles - Tests for colour fastness - Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:2013)*

EN ISO 527-1, *Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1:2012)*

EN ISO 527-3, Plastics - *Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3:1995)*

EN ISO 846, *Plastics - Evaluation of the action of microorganisms (ISO 846:1997)*

EN ISO 1182, *Reaction to fire tests for products - Non-combustibility test (ISO 1182:2010)*

EN ISO 1421, *Rubber- or plastics-coated fabrics - Determination of tensile strength and elongation at break (ISO 1421:1998)*

EN ISO 1716, *Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value) (ISO 1716:2010)*

EN ISO 2286-2, *Rubber- or plastics-coated fabrics - Determination of roll characteristics - Part 2: Methods for determination of total mass per unit area, mass per unit area of coating and mass per unit area of substrate (ISO 2286-2:1998)*

EN ISO 2286-3, *Rubber- or plastics-coated fabrics - Determination of roll characteristics - Part 3: Method for determination of thickness (ISO 2286-3:1998)*

EN ISO 9001, *Quality management systems - Requirements (ISO 9001:2008)*

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EN ISO 11925-2, *Reaction to fire tests - Ignitability of products subjected to direct impingement of flame – Part 2: Single-flame source test (ISO 11925-2:2010)*

ISO 2528:1995, *Sheet materials - Determination of water vapour transmission rate - Gravimetric (dish) method*

CEN/TS 16516, *Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air*

3 Terms and definitions

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

3.1
stretched ceiling
ceiling covering comprising a continuous area obtained from one width or assembled widths kept under tension at its edges by a fastening system. This stretched ceiling shall be able to be completely dismantled and re-installed without having to change it. The fastening system is sold separately.

These widths may be single or multi-layered sheets, coated fabrics or fabrics made up of coated yarn or monofilaments. A stretched ceiling may be perforated or not, with or without openings.

Note 1 to entry: The stretched ceiling may need to be dismantled and re-installed to have access to the plenum space e.g. for maintenance, reparation or installation of new appliances, etc.

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3.2
product family
total range of products within specific variability limits (defined by the manufacturer or a technical specification) of the product parameters and, if appropriate, of the final use parameters for which the specified safety characteristics do not change (do not deteriorate)

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This means that the test results obtained for one product in the family remain valid for all the products in the family

3.3
edge profile
element fixed at the periphery of the ceiling to keep the ceiling stretched

3.4
anchoring device
element connecting the stretched ceiling to the edge profile

4 Product characteristics

4.1 Characteristics relevant for all stretched ceilings

4.1.1 Reaction to fire

The manufacturer is required to make a declaration of the reaction to fire performance (i.e. if the stretched ceiling is subject to regulations). The stretched ceilings shall be classified in accordance with the requirements of EN 13501-1 when tested according to Clause 5. The resulting class shall be declared.

If it is decided to place a product family on the market as a class F product, no test is required for this product family.

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4.1.2 Dangerous substances

4.1.2.1 Very volatile organic compound (VVOC) as defined in CEN/TS 16516

The stretched ceilings shall be tested according to CEN/TS 16516.

If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

— Acetaldehyde

— Acetone

— Aldehydes

— Aliphatic hydrocarbons

— Aliphatic alcohols

— Amines

— Esters

— Formaldehyde

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4.1.2.2 Volatile organic compounds (VOC) as defined in CEN/TS 16516

The stretched ceilings shall be tested according to CEN/TS 16516.

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If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

— benzene

— styrene

— volatile organic compounds

4.1.2.3 Semi volatile organic compound (SVOC) as defined in CEN/TS 16516

The stretched ceilings shall be tested according to CEN/TS 16516.

If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

— dibutyl pthalate

4.1.2.4 Organic compounds associated with particulate matter (or particulate organic matter) (POM) and semi-volatile organic compounds subject to content regulations

The stretched ceilings shall be tested according to EN 12149 or CEN/TC 351xxx.

If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

— polybrominated diphenylethers : commercial Pentabromodiphenyl ether

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— polybrominated diphenylethers : commercial Octadibromodiphenylether

— polybrominated diphenylethers : decabromodiphenylether

— di(2-ethyhexyl)phthalate (DEHP)

4.1.2.5 Inorganic substances

The stretched ceilings shall be tested according to EN 12149 or CEN/TC 351xxx.

If ammonia compounds are not added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

4.1.2.6 Metals

The stretched ceilings shall be tested according to EN 12149 which shall be tested according to CEN/TC 351xxx.

If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

— cadmium and its compounds

— lead

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4.1.3 Other dangerous substances

4.1.3.1 General

National regulations on dangerous substances, other than those already covered in other clauses of this standard, may require verification and declaration on release, and sometimes content, when construction products covered by this standard are place on those markets. In the absence of European harmonised test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

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

4.1.3.2 Heavy metals and other elements

4.1.3.2.1 Requirements

The migration of heavy metals and other elements, expressed in mg/kg of stretched ceiling, shall not exceed the values given in Table 1 (after correction as specified in 4.3.1.1.1) when measured in accordance with test A in EN 12149.

If none of these substances is added during manufacture and if the raw materials are certified by the supplier as not containing these substances, the test is not necessary.

4.1.3.2.2 Interpretation of results

The analytical results obtained in the tests specified in EN 12149 shall be corrected by subtracting the analytical correction factors given in Table 2 to obtain a corrected analytical result.

The stretched ceilings are considered as satisfying the requirements of this document if the corrected analytical result is equal to or less than the limits indicated in Table 1.

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NOTE 1 Given the reliability of the methods specified in this EN 12149, it is necessary to use the corrected analytical results to take into account the results of the interlaboratory tests (see Annex D of EN 71-3).

EXAMPLE analytical result for lead: 120 mg/kg.

Corresponding analytical correction in Table 2: 30 %.

Corrected analytical result = 120 - (120 × 30) / 100 = 120 - 36 = 84 mg/kg. This is considered to meet the requirements of the standard (lead: 90 mg/kg).

NOTE 2 The measuring methods used in EN 12149 are derived directly from EN 71-3 on the safety of toys. Annex D of EN 71-3, in particular D.4 "Statistical uncertainty of the test procedure and interpretation of results", justifies the introduction of a correction factor.

Table 1 — Maximum migration of heavy metals and other elements

Heavy metal or element	Symbol	Maximum migration in mg/kg of stretched ceiling
Antimony	Sb	60
Barium	Ba	500
Selenium	Se	165

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Table 2 — Analytical correction factor

Element	Sb	Ba	Se
Analytical correction factor (in percentage)	60	30	60

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4.1.3.3 Vinyl chloride monomer

The maximum content of vinyl chloride monomer shall be less than 10 mg/kg measured as described in test B of EN 12149.

If vinyl chloride or the products containing vinyl chloride are not added during manufacture and if the raw materials are certified by the supplier as containing less than 10 mg/kg of vinyl chloride, the test is not necessary.

4.1.4 Water vapour permeability

If they are used as a vapour barrier, stretched ceilings in the form of single or multi-layered sheets and full coated fabrics shall have a water vapour permeability of < 50 g/m^2/24 h (measured in accordance with the conditions of procedure B in ISO 2528).

4.1.5 Susceptibility to the growth of harmful micro-organisms

The stretched ceilings shall be tested according to EN ISO 846 – Method A and the result shall be declared.

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4.1.6 Durability

Whenever required, durability shall be checked by indirect way by assessing:

- testing tensile strength,
- tear strength,
- dimensional stability under the effect of moisture
- heat shrinkage

in accordance with Tables 3 and 4 of this standard, and

- resistance of the assembly

in accordance with paragraphs 4.2.2 and 4.3.2.

4.2 Other product characteristics specific to stretched ceilings made of single or multi-layered sheets

4.2.1 Materials characteristics

Stretched ceilings made up of single or multi-layered sheets described in this document shall meet the requirements specified in Table 3 when they are subjected to the tests indicated.

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Table 3 — Materials characteristics

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Characteristics	Units	Requirements	Test method
Mass per unit area	%	Nominal value ± 10	Annex B
Thickness	%	Nominal value ± 10	EN ISO 2286-3 with a pressure of 2 kPa
Colour fastness to light	-	≥ 6	EN ISO 105 – B 02
Dimensional stability after exposure to humidity [a]	%	≤ 1 in each direction	Annex C
Heat shrinkage	%	≤ 4, 5 in each direction	Annex E
Breaking strength	N/mm^2	longitudinal ≥ 12 transverse ≥ 10	EN ISO 527-3 with a type 2 test piece
Elongation at break	%	longitudinal ≥ 140 transverse ≥ 150	

[a] The test may be carried out on the basis of the final use of the ceiling (example: chlorinated atmosphere).

4.2.2 Stretched ceiling characteristics

When tested according to Annex D, the resistance of the assembly shall be ≥ 2 x operating stress expressed in daN.

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4.3 Other product characteristics specific to stretched ceilings made of coated fabrics and fabrics made up of coated yarn or monofilaments

4.3.1 Materials characteristics

Stretched ceilings made of the coated fabrics of coated yarn or monofilaments described in this document shall meet the requirements specified in Table 4, when subjected to the tests indicated.

Table 4 — Materials characteristics

Characteristics	Units	Requirements		Test method
		fabrics with a mass per unit area > 350g /m^2	fabrics with a mass per unit area ≤ 350g /m^2	
Mass per unit area	%	Nominal value ± 10		EN ISO 2286-2
Colour fastness to light	-	≥ 6		EN ISO 105-B 02
Dimensional stability after exposure to humidity [a]	%	≤ 1 in each direction		Annex C
Dimensional stability after exposure to heat	%	< 1 in each direction	< 10 °C to 60 °C	EN 12280-1 (30 min)
Tensile strength	daN/5 cm	> 50	> 10	EN ISO 1421
Tear strength	daN	> 10	> 3	EN 1875-3
[a] The test may be carried out on the basis of the final use of the ceiling (example: chlorinated atmosphere).				

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4.3.2 Stretched ceiling characteristics

When tested according to EN ISO 1421 the resistance of the assembly

- made of fabrics with a mass per unit area > 350g/m^2 shall be > 20 daN/5 cm
- made of fabrics with a mass per unit area ≤ 350g /m^2 shall be > 8 daN/5 cm

4.4 Provisions regarding attachment systems (edge profiles and anchoring devices)

4.4.1 Suitability for dismantling and re-assembly

The fastening system shall allow the stretched ceiling to be completely dismantled and re-installed without any damage as often as necessary according to the state of art.

4.4.2 Mechanical strength

The stretched ceiling and its attachment system shall be at least equal to the strength of the assembly specified for the stretched ceiling in 4.2.2 and 4.3.2 as relevant.

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5 Testing, assessment and sampling methods – Reaction to fire

5.1 Preparation and conditioning of test pieces

The test pieces shall be conditioned prior to the test in accordance with EN 13238.

5.2 Ignitability test

The ignitability test shall be carried out in accordance with EN ISO 11925-2.

The flame shall be applied to the surface of the test piece fixed on the test piece holder by means of small pins incorporated in the surface of the U-shaped frame

5.3 SBI "Single Burning Item" test

5.3.1 Mounting and fixing conditions

Carry out the reaction to fire test in accordance with EN 13823.

The stretched ceilings shall be tested perpendicularly in the test piece holder trolley for the SBI comprising one small wing (550 ± 5) mm × (1 500 ± 5) mm and one large wing (1 000 ± 5) mm × (1 500 ± 5) mm.

a) In the case of single or multi-layered sheets, take 850 mm × 1 800 mm of the sheet to make the small wing and 1 300 mm × 1 800 mm to make the large wing. Stretch the sheet in the transverse direction across a calcium silicate panel with a tensile force of 30 daN/m determined in accordance with EN ISO 527-3.

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There shall be an air gap of 40 mm (or less) between the stretched ceiling and the substrate when assembling the ceiling. This air gap is obtained by means of a calcium silicate frame of desired thickness fixed to the perimeter of the substrate of the small and the large wing.

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The final configuration may be obtained by pinching the stretched ceiling at the back of the substrate by means of an aluminium track and a PVC ring. Adequate tension shall be applied to obtain a satisfactory degree of flatness and no creasing over the whole of the exposed surface (see Figure A.1 in Annex A).

b) In the case of coated fabrics or those made of coated yarn or monofilaments, take a 1 500 mm × 1 500 mm test piece. Fix the test piece to a metallic frame (see Figures A.2, A.3 and A.4 in Annex A). This frame comprises an assembly of stainless steel tubes of rectangular cross-section forming two perpendicular wings, one small and one large.

Attach the test piece to the peripheral members of the frame by means of the steel pins. Prior to the test, the test piece shall be adequately stretched and flat so that no more that 30 % of the total exposed surface shrinks by more than 10 mm from the coplanar vertical plane at the back of the U-profile

Then place the frame against the U-profile on the test piece holder trolley. To be representative of the final use, conduct the test with a ventilated space 80 mm (or less) wide at the back of the test piece in accordance with EN 13823.

Attach two calcium silicate walls made up of one small wing of (580 ± 5) mm × (1 500 ± 5) mm and one large wing of (1 080 ± 5) mm × (1 500 ± 5) mm vertically 80 mm from the test piece. The sides furthest away from the angle and the spaces behind each wing shall be left open.

5.3.2 Extended application of the results

The reaction to fire classification obtained according to 5.3.1 is valid for all dimensions of the air gap. If a higher air gap dimension is tested then the fire classification is valid for the air gap dimension equal or higher than the air gap dimension tested.