SLOVENSKI STANDARD
oSIST prEN 17686:2021

01-september-2021

Hidroizolacijski trakovi - Določanje odpornosti proti vetrni obremenitvi strešnega sistema z vezanimi vodoodpornimi sistemi

Flexible sheets for waterproofing – Determination of the resistance to wind load of roof build-up system with bonded waterproofing systems

Abdichtungsbahnen - Bestimmung der Widerstandsfähigkeit gegen Windlast bei verklebten Dachabdichtungsbahnen

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Feuilles souples d'étanchéité - Détermination de la résistance à l'arrachement au vent d'un système de toiture avec système d'étanchéité adhérent

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Ta slovenski standard je istoveten z: **prEN 17686**

ICS:

91.060.20	Strehe	Roofs
91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials

oSIST prEN 17686:2021 **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

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ICS 91.100.50

English Version

Flexible sheets for waterproofing - Determination of the resistance to wind load of roof build-up system with bonded waterproofing systems

Abdichtungsbahnen - Bestimmung der Widerstandsfähigkeit gegen Windlast bei verklebten Dachabdichtungsbahnen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 254.

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
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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oSIST prEN 17686:2021

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)

oSIST prEN 17686:2021
https://standards.iteh.ai/catalog/standards/sist/01d3dd83-2700-47a8-805d-f9a995986f92/osist-pren-17686-2021

oSIST prEN 17686:2021

European foreword

This document (prEN 17686:2021) has been prepared by Technical Committee CEN/TC 254 “Flexible sheets for waterproofing”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

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oSIST prEN 17686:2021
https://standards.iteh.ai/catalog/standards/sist/01d3dd83-2700-47a8-805d-f9a995986f92/osist-pren-17686-2021

oSIST prEN 17686:2021

Introduction

The test is performed on a test configuration, e.g. a load-bearing structure, an AVCL, a layer of insulation material and the partial or fully bonded roof waterproofing sheets.

For the calculation of the performance of wind load resistance of the whole roof, see the relevant national and/or international standards.

The result of this document is the resistance to wind load of the flexible roof waterproofing system expressed as the characteristic load per square metre. Safety and correction factors can be defined by national regulation and/or within European or national application documents.

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oSIST prEN 17686:2021
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1 Scope

This document specifies the test method to determine the resistance to wind load of the roof build-up system with the waterproofing system bonded to the substrate.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13707:2004+A2:2009, *Flexible sheets for waterproofing - Reinforced bitumen sheets for roof waterproofing - Definitions and characteristics*

EN 13956:2012, *Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - Definitions and characteristics*

EN 13416, *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Rules for sampling*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

3 Terms and definitions

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For the purposes of this document, the terms and definitions given in EN 13707:2004+A2:2009, EN 13956:2012 and the following apply.

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https://standards.iteh.ai/catalog/standards/sist/01d3dd83-2700-47a8-805d-f9e995986f92/osist-pren-17686-2021

3.1
air open system
roof build-up system *with* air flow from the outside of the test specimen onto the underside of the waterproofing system

3.2
air tight system
roof build-up system *without* air flow from the outside of the test specimen onto the underside of the waterproofing system

3.3
air and vapour control layer
AVCL
layer used to limit or prevent the transportation of air and water vapour into the layers of the roof build-up system above the structural deck

3.4
bonded flexible sheets
flexible sheets adhered to a substrate by cold or hot bonding

3.5
cold bonding
adhering a waterproofing system to a substrate without the use of additional heat with or without adding adhesive

oSIST prEN 17686:2021

3.6
fastening system
element(s) intended to secure the insulation boards to the structural deck

3.7
hot bonding
adhering a waterproofing system to a substrate by heating the surface of the sheet or by adding heated adhesive

3.8
jointing technique
technique of material-specific seam and butt jointing of flexible sheets

3.9
roof build-up system
total build-up of all the different layers which forms the roof from the structural deck to waterproofing system

Note 1 to entry: The system could for instance include layers such as AVCL(s), layer(s) of insulation material and layer(s) of the partial or fully bonded roof waterproofing sheet(s).

3.10
structural deck
layer which has to transfer both permanent and variable loads to the other construction parts of the roof or building

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3.11
substrate
layer placed directly below the waterproofing system

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Note 1 to entry: The substrate is the next surface below the waterproofing system within the roof build-up system. This could be e.g. the insulation board, plywood, concrete deck.

3.12
test specimen
representative part of the roof build-up system

3.13
waterproofing system
assembly of one or more layers of flexible sheets in its applied and jointed form to be used on a roof, which has certain performance characteristics, to be assessed as a whole

Note 1 to entry: This definition is in line with EN 13707:2004+A2:2009 and EN 13956:2012, but slightly adjusted to fit the purpose of this document.

oSIST prEN 17686:2021

4 Symbols and abbreviations

For the purposes of this document, the following symbols apply.

		Unit
g	number of gusts, specified for each “proportional” peak load in a cycle	-
i	proportional part of $P_{100\,\%;n}$	%
n	number of cycles until failure	-
n_f	number of the cycle at which the test specimen fails	-
P_i	peak pressure in the pressure chamber during a gust	N/m²
$P_{100\,\%;n}$	peak pressure in the pressure chamber during a cycle (n)	N/m²
$P_{100\,\%;nf\text{-}1}$	peak pressure of the cycle preceding the cycle of failure	N/m²
t	time	s
$\Delta W_{100\,\%;n}$	maximum peak load per cycle (n)	N/m²
ΔW_a	applied load	N/m²
W_{char}	characteristic load for resistance to wind uplift of the bonding of the build-up system with bonded waterproofing system	N/m²
ΔW_i	peak load	N/m²

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5 Sampling

If required the flexible sheets for roof waterproofing shall be sampled according to EN 13416 and all additional components to construct the test specimen shall be sampled according to the sampling requirements of the relevant European harmonized technical specifications or to the instructions of the applicant.

6 Test conditions

The test specimen and the apparatus shall be conditioned in an environment of (23 ± 5) °C for at least 16 h prior to the test.

The test specimen shall be tested under the same conditions.

7 Apparatus and additional devices

7.1 Pressure chamber

7.1.1 General

The pressure chamber shall meet the following requirements:

- The internal length and width of the pressure chamber shall be according to 7.1.2.
- The pressure chamber shall be provided with one or more windows in such a way that the test specimen can be observed during testing.
- It shall be possible to create an airtight seal between the test specimen and the pressure chamber.

oSIST prEN 17686:2021

- The pressure chamber is recommended to be capable of resisting a suction pressure of at least 10 000 N/m²
- The height of the pressure chamber shall be such that the applied pressure is equally distributed and not affected by deformations of the test specimen.
- The pressure chamber and additional devices shall be calibrated according to 7.2.

The pressure chamber shall include a:

- fan including control and recording system according to 7.1.3;
- pressure and time measurement and registration device according to 7.1.4;
- thermometer according to 7.1.5;
- chronometer according to 7.1.6.

7.1.2 Dimensions of the test area

The minimum effective test area of the test specimen shall be 4 m². In case one dimension is less than 2 m the effective area of the test specimen shall at least be 8 m². The minimum dimension is 1,5 m.

NOTE The effective test area is equal to the internal dimensions of the pressure chamber.

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7.1.3 Fan and controlling equipment

The combination of the fan and the controlling equipment shall be capable of producing the dynamic load cycles, as defined in 9.4.

oSIST prEN 17686:2021
https://standards.iteh.ai/catalog/standards/sist/01d9dd83-2700-47a8-805d-f9a995986f92/osist-pren-17686-2021

7.1.4 Pressure and time measurement and registration device

The pressure and time measurement device shall have a measurement accuracy according to ISO/IEC Guide 98-3 of less than ± 2 %. A minimum accuracy of 20 N/m² is allowed.

The pressure and time registration device shall be capable of registering and storing the pressure level every 0,1 s during the whole test period.

7.1.5 Thermometer

The thermometer shall be capable of measuring between at least 0 °C up to 30 °C with a measurement tolerance less than or equal to ± 1 °C in combination with the registration apparatus used. The thermometer shall be placed within the test chamber.

7.1.6 Chronometer

The chronometer shall be capable of measuring within a range of at least 60 s and have a measurement tolerance less than or equal to ± 0,1 s in combination with the registration apparatus used.

7.2 Calibration

7.2.1 Calibration pressure chamber

The initial calibration of the test equipment shall be carried out at a suction pressure (P_i) of 3 000 N/m² and 6 000 N/m² generating a load/time diagram according to Figure 2, on a rigid structure with a time tolerance of ± 0,1 s.