



# SLOVENSKI STANDARD

## oSIST prEN 17990:2023

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**Toplotna izolacija in varčevanje z energijo v stavbah - Metoda za določanje obstojnosti lepljenja z lepilnimi trakovi in lepilnimi masami za vzpostavitev zrakotesnih slojev v podnebnih razmerah, reprezentativnih za notranje prostore**

Thermal insulation and energy economy in buildings - Method to determine the durability of bondings with adhesive tapes and adhesive masses for the establishment of airtight layers under climatic conditions representative for indoor environments

Wärmeschutz und Energieeinsparung in Gebäuden - Methoden zum Nachweis der Dauerhaftigkeit von Verklebungen mit Klebebändern und Klebmassen zur Herstellung von luftdichten Schichten unter klimatischen Bedingungen von Innenräumen

Isolation thermique et économie d'énergie dans les bâtiments - Méthode de détermination de la durabilité des collages avec des rubans adhésifs et des masses adhésives pour l'établissement de couches étanches à l'air dans des conditions climatiques représentatives des environnements intérieurs

**Ta slovenski standard je istoveten z: prEN 17990**

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**ICS:**

91.120.10	Toplotna izolacija stavb	Thermal insulation of buildings
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EUROPEAN STANDARD  
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**DRAFT**  
**prEN 17990**

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English Version

**Thermal insulation and energy economy in buildings -  
Method to determine the durability of bondings with  
adhesive tapes and adhesive masses for the establishment  
of airtight layers under climatic conditions representative  
for indoor environments**

Détermination de la durabilité des rubans adhésifs et  
des masses adhésives pour la fabrication des couches  
étanche à l'air

Wärmeschutz und Energieeinsparung in Gebäuden -  
Methoden zum Nachweis der Dauerhaftigkeit von  
Verklebungen mit Klebebändern und Klebmassen zur  
Herstellung von luftdichten Schichten unter  
klimatischen Bedingungen von Innenräumen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 89.

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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**prEN 17990:2023 (E)**

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## **European foreword**

This document (prEN 17990:2023) has been prepared by Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS.

This document is currently submitted to the CEN Enquiry.

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## prEN 17990:2023 (E)

### 1 Scope

This document specifies methods to determine the durability of bondings, prepared by means of adhesive materials (e.g. adhesive tapes and adhesive masses), for the establishment of airtight layers under climatic conditions representative for indoor environments based on test methods with and without ageing.

The methods provided in this document are neither suitable for a short time evaluation of durability nor can they be applied to in-field testing.

This document excludes test methods for external weathering or UV exposure, even though this might occur during the construction phase.

The following typical applications are distinguished:

- bonding of the overlap of flexible airtightness layers;
- bonding of flexible airtightness layers to construction products and penetrations;
- establishment of airtightness layers by means of sheet materials and adhesive tapes.

This document does not cover test methods for:

- pre-compressed sealing tapes and sealing profiles which will be mechanically secured;
- butyl-based adhesive tapes or adhesive masses;
- sheet joints of wood-based panels or gypsum plasterboards with adhesive masses or filler systems;
- bondings of bitumen membranes or of bitumen membranes to construction products;
- bonding of self-adhesive membranes;
- adhesive masses from reels. Adhesive masses from reels are cured viscoelastic adhesive masses, which are used in the same field of application as adhesive masses.

The tack is not addressed. It does not allow any conclusion on the durability of a bonding.

### 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 205, *Adhesives - Wood adhesives for non-structural applications - Determination of tensile shear strength of lap joints*

EN 12317-2, *Flexible sheets for waterproofing - Determination of shear resistance of joints - Part 2: Plastic and rubber sheets for roof waterproofing*

EN ISO 10365, *Adhesives - Designation of main failure patterns (ISO 10365)*

EN ISO 11339, *Adhesives - T-peel test for flexible-to-flexible bonded assemblies (ISO 11339)*

EN ISO 29862, *Self adhesive tapes - Determination of peel adhesion properties (ISO 29862)*

ISO 8296, *Plastics - Film and sheeting - Determination of wetting tension*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 29862 and EN 12317-2 and the following apply.

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp/>

#### 3.1

##### **airtightness layer**

layer formed by membranes, boards or other airtight elements installed on the warm side of the insulation to prevent uncontrolled air movement through the building envelope

#### 3.2

##### **durability**

functionality of the intended use for a long period of time (service life of construction products or building constructions) without failure or without failing to meet the minimum requirements of this standard

#### 3.3

##### **double-sided adhesive tape**

viscoelastic adhesive film with or without embedded carrier which is immediately adhesive on both sides

#### 3.4

##### **single-sided adhesive tape**

viscoelastic adhesive film which is immediately adhesive and is covered with a carrier on one side

#### 3.5

##### **adhesive mass**

non-cured mass which viscoelastically cures due to drying or chemical reaction or which is applied by melting

Note 1 to entry: Adhesive masses are a subgroup of adhesives according to EN 923.

#### 3.6

##### **substrate**

surface on which the adhesive material is applied

Note 1 to entry: The adhesion between the substrate and the adhesive film or adhesive mass constitutes the bonding under test.

#### 3.7

##### **supporting carrier**

suitable substrate which is needed for the application of force on the bonding under test

Note 1 to entry: The adhesion of the supporting carrier to the adhesive film or adhesive mass has to be sufficiently strong to allow for the test of the bonding to be examined.

#### 3.8

##### **reference test**

test of the adhesion of adhesive materials on reference substrates (defined surfaces) with or without artificial ageing

**prEN 17990:2023 (E)****3.9****test of a product combination**

system test

test of the adhesion of a combination of adhesive materials and substrates other than the reference substrates

EXAMPLE Combination of sheet x and adhesive material y.

**4 Symbols and units**

The symbols and units used in this document are given in Table 1.

**Table 1 — Symbols and units**

<b>Symbols</b>	<b>Quantity</b>	<b>Unit</b>
$F$	Measured value of peeling force (reading of the testing machine; i.e. related to 25 mm sample width)	N
$F_{\max}$	Maximum measured value of peeling force (reading of the testing machine; i.e. related to 25 mm sample width)	N
$v_0$	Cross-head speed during the peel test	mm/min
$s_0$	Peeling distance where the evaluation for the T-peel test and 180° peel test starts	mm
$s_1$	Peeling distance where the evaluation for the T-peel test and 180° peel test ends	mm
$b$	Width of the adhesive joint	mm
$F_{S,m}$	Mean peeling force without ageing, converted to 10 mm width	N / 10 mm
$F_{S,\max}$	Maximum peeling force without ageing, converted to 10 mm width	N / 10 mm
$F_{S,m,a120}$	Mean peeling force after accelerated ageing, converted to 10 mm width (120 days)	N / 10 mm
$F_{S,\max,a120}$	Maximum peeling force after accelerated ageing, converted to 10 mm width (120 days)	N / 10 mm
$\varphi$	Relative humidity	% RH
$\vartheta$	Temperature	°C

**5 Testing****5.1 General**

The reference test and the test of product combinations shall be performed with and without artificial ageing. To full fill the requirements of this document, it is sufficient to perform the tests on the reference substrates.

The mechanical characteristics of the bonding of two material layers prepared by means of adhesive tape or adhesive mass is examined before and after artificial ageing. In the course of a test, the reference case shall be examined.



In addition, a product combination can be optionally tested. In this case, testing is performed according to 5.2.2. If the substrates of tested product combinations are changed whilst using the same adhesive material, only the new product combination shall be tested.

The boundary conditions of the test methods in terms of temperature, humidity and duration are given in Table 2 for adhesive tapes and in Table 3 for adhesive masses.

NOTE Contents regarding conformity assessment are not part of this standard. See DIN 18200 for the assessment of conformity.

## 5.2 Test substrate

### 5.2.1 Reference substrate

In the reference test, the adhesive materials shall be examined on the following substrates:

- a) a plastic sheet (a non-sealable, non-deep-drawable and not etched or otherwise pre-treated biaxially orientated polyester film boPET sheet; see [1]) having a surface tension  $\geq 40$  mN/m and a thickness of 50  $\mu\text{m}$ . The surface tension of the plastic sheet shall be determined according to ISO 8296;
- b) beechwood according to EN 205.

NOTE In the following, the abbreviated designations "boPET" and "beech" are used for the reference substrates.

### 5.2.2 Product combinations

When testing product combinations, adhesive materials on substrates are examined, for which the manufacturer of the adhesive material and/or substrate intends to confirm the durability of the bonding by means of artificial ageing.

Combinations of adhesive materials and substrates, which are intended to be offered as a product combination according to this standard shall be tested in accordance with Table 2 and Table 3, respectively.

In case of system tests, that side of the sheet is tested which usually corresponds to the position of installation (different surfaces of airtightness layers).

## 5.3 Climatic boundary conditions

The boundary conditions of the individual tests are given in Table 2 and Table 3.

Testing of adhesive tapes is performed after conditioning in accordance with Table 2 and testing of adhesive masses is performed in accordance with Table 3.

## 5.4 Apparatus

### 5.4.1 Pressure roller and support

Steel roller with a rubber bandage of approximately 6 mm thickness, which meets the following specifications:

- Outer diameter (including rubber bandage):  $(85 \pm 2,5)$  mm;
- Weight of the pressure roller:  $(2\ 000 \pm 10)$  g;
- Width:  $(50 \pm 1,5)$  mm;

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— Hardness of the rubber bandage:  $(80 \pm 5)$  Shore A.

**NOTE** If, for reasons of the practicability of sample preparation, a different width of the pressure roller seems to be convenient, the width of the pressure roller can be altered if the line pressure (approximately 40 g/mm) is observed.

The bandage surface shall be cylindrical without any concave or convex deviations.

By means of a suitable bearing, it shall be possible to steer the pressure roller such that the samples are loaded only by the weight of the pressure roller itself.

The pressure roller shall be mechanically or manually actuated and shall be moved with a mean speed of approximately 10 mm/s. During sample preparation, each part of the joint shall be rolled over twice.

Rolling shall take place on a flat rigid support (e.g. steel or glass).

In case of thick substrates, particular attention shall be paid to press on all areas of the joint. For this purpose, it might be advisable to roll over the joint in sections beyond the width of the joint, taking care that individual sections at the edges are not rolled over more than twice.

**5.4.2 Device for cutting sample strips (test pieces)**

In order to cut sample strips to size, a suitable device shall be used which allows for the preparation of samples with a width of  $(25 \pm 0,2)$  mm.

**5.4.3 Tensile testing machine**

For the tests according to 5.6.2 and 5.6.3, a testing machine shall be used which meets the following requirements:

- option to vertically mount the prepared sample without any strain in the testing machine where the clamping distance between the upper and lower clamp is 100 mm. The clamps shall ensure a non-slip application of force on the sample;
- option to generate and control a constant cross-head speed ( $v_0 = 10$  mm/min or 100 mm/min, with a tolerance of  $\pm 2$  %) throughout the entire test duration;
- measuring system to determine the test force  $F$  with the capability of recording the measured values during the test with a sampling frequency of at least 5 Hz.

In the force range between the pre-load  $F = 0,5$  N to  $F = 1$  N, the test force  $F$  shall be determined with a measurement uncertainty of  $\pm 2$  %, and for forces above  $F = 1$  N, it shall be determined with a measurement uncertainty of  $\pm 1$  %.

**5.4.4 Climatic chamber for artificial ageing**

In order to perform the artificial ageing according to Table 2 and Table 3, a climatic chamber (climate cabinet) is required in which the temperature can be set to  $\vartheta = (65 \pm 2)$  °C and the relative humidity can be adjusted to  $\varphi = (80 \pm 5)$  %.

**5.4.5 Conditioned room**

In order to prepare the samples and to perform the tests according to Table 2 and Table 3, a conditioned room is required in which the temperature can be set to  $\vartheta = (23 \pm 2)$  °C and the relative humidity can be adjusted to  $\varphi = (50 \pm 5)$  %.