



SLOVENSKI STANDARD
oSIST prEN 16383:2012
01-april-2012

**Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje obnašanja
higrotermičnih zunanjih sestavljenih toplotnoizolacijskih sistemov z ometi (ETICS)**

Thermal insulating products for building applications - Determination of the hygrothermal behaviour of external thermal insulation composite systems with renders (ETICS)

Wärmedämmstoffe für das Bauwesen - Bestimmung des hygrothermischen Verhaltens von außenseitigen Wärmedämm-Verbundsystemen mit Putzen (WDVS)

Produits isolants thermiques pour le bâtiment - Détermination du comportement hygrothermique des systèmes composites d'isolation thermique par l'extérieur avec enduits (ETICS)

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Ta slovenski standard je istoveten z: prEN 16383

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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en,fr,de

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EUROPEAN STANDARD
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prEN 16383

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ICS 91.100.60

English Version

Thermal insulating products for building applications - Determination of the hygrothermal behaviour of external thermal insulation composite systems with renders (ETICS)

Produits isolants thermiques pour le bâtiment -
Détermination du comportement hygrothermique des
systèmes composites d'isolation thermique par l'extérieur
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Wärmedämmstoffe für das Bauwesen - Bestimmung des
hygrothermischen Verhaltens von außenseitigen
Wärmedämm-Verbundsystemen mit Putzen (WDVS)

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 88.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (prEN 16383:2012) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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1 Scope

This European Standard specifies the equipment and procedures for determining the hygrothermal behaviour of external thermal insulation composite systems with renders on thermal insulation boards (ETICS) delivered as a kit and used as thermal insulation for buildings.

2 Normative references

The following referenced documents are indispensable for the application 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 998-1, *Specification for mortar for masonry — Part 1: Rendering and plastering mortar*

EN 1062-1, *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Part 1: Classification*

EN 13494, *Thermal insulating products for buildings applications — Determination of the tensile bond strength of the adhesive and of the base coat to the thermal insulation material*

EN 13496, *Thermal insulation products for building applications — Determination of the mechanical properties of glass fibre meshes*

EN 13497, *Thermal insulation products for building applications — Determination of the resistance to impact of external thermal insulation composite systems (ETICS)*

EN 15824, *Specifications for external renders and internal plasters based on organic binders*

EN ISO 3251, *Paints, varnishes and plastics — Determination of non-volatile-matter content (ISO 3251)*

EN ISO 3451-1, *Plastics - Determination of ash — Part 1: General methods (ISO 3451-1)*

3 Terms and definitions

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

3.1

adhesive for ETICS

product used for bonding the thermal insulation material to the substrate

3.2

base coat for ETICS

layer according to EN 998-1 or EN 15824 applied directly on to the thermal insulation material. It contains the reinforcement. The base coat provides most of the mechanical properties of an ETICS

3.3

external thermal insulation composite system (ETICS)

system of factory made products, delivered as a kit from the manufacturer and applied on site

NOTE 1 It comprises of the following components, specifically designed for use with the substrate:

- an adhesive and/or mechanical fixing device;
- a thermal insulation product;
- one or more layers of base coat, where at least one layer contains a reinforcement;
- a finishing material.

NOTE 2 Adapted from EN ISO 9229:2007, definition 2.4.2.2.

3.4

finishing material for ETICS

organic an/or inorganic materials according EN 998-1, EN 1062-1 or EN 15824, forming the final layer of an ETICS

NOTE A key coat (primer) and a decorative coat may be part of the finishing coat.

3.5

mechanical fixing devices for ETICS

devices for securing thermal insulation systems to the substrate, for example rails or anchors

3.6

reinforcement for ETICS

materials embedded in the base coat to improve its mechanical strength

3.7

thermal insulation material

material that is intended to reduce heat transfer and that derives its insulation properties from its chemical nature and/or its physical structure

[EN ISO 9229]

3.8

test wall

the wall as substrate covered by the ETICS to test the hygrothermal behaviour

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4 Principle

To simulate the aging of an ETICS under the influence of heating by solar radiation, rain, and air temperature in practice with testing the hygrothermal behaviour at direct heating, wetting and freeze/thaw in several cycles.

5 Testing devices

The following test devices are necessary:

- wetting device: To wet the full surface of the test wall with tap water with a temperature of $(15 \pm 5) ^\circ\text{C}$ and an amount of between $1 \text{ l}/(\text{m}^2 \cdot \text{min})$ and $1,5 \text{ l}/(\text{m}^2 \cdot \text{min})$ with the use of spraying nozzles to assure uniform water distribution;
- heating device: To heat the surface of the wall regulated to $(70 \pm 5) ^\circ\text{C}$. At the heating time, the relative humidity of the air close to the surface of the wall shall be less than 30 %;
- cooling device: To cool the surface of the test wall to $(-15 \pm 5) ^\circ\text{C}$.

6 Test wall

6.1 Preparation of the test wall

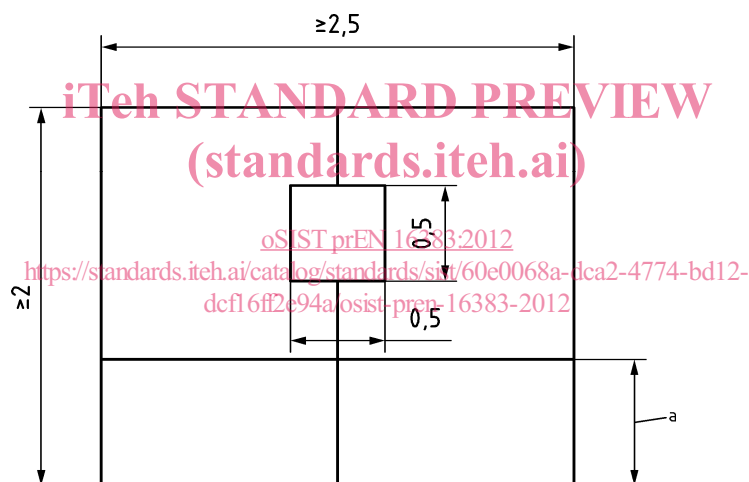
The substrate shall be made of masonry or concrete if not otherwise specified.

The dimensions of the weathered surface of the wall shall be (see Figure 1):

- surface $\geq 5 \text{ m}^2$;
- width $\geq 2,5 \text{ m}$;
- height $\geq 2 \text{ m}$.

In the middle of the upper 2/3 of the total height of the wall an opening with a width of $(0,5 \pm 0,1) \text{ m}$ and a height of $(0,5 \pm 0,1) \text{ m}$ is included (see Figure 1). The opening can be obtained by a recess in the insulation material.

Two different configurations can be tested on one test wall. In this case the wall must be divided vertically in the middle and one component can be modified, i.e. the thermal insulation product or the base coat or the finishing coat according to Figure 1.



Key

- a 1/3 of the total wall height

Figure 1 — Scheme of the test wall with opening

Four different finishing coats can be tested with two openings according to Figure 2, when the width of the wall is equal to or larger than 3 m.

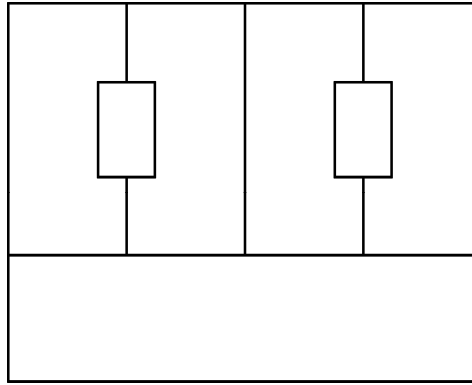


Figure 2 — Scheme of the test wall with two openings

The ETICS has to be applied on the substrate according to instructions of the manufacturer. The components of the ETICS to be tested must be agreed between the parties.

After application of the base coat according to manufacturers information the surface is to be coated with the finishing coat or coats.

One third of the height of the test wall measured from the bottom edge shall be covered only by base coat. Within this area at least one horizontal joint between thermal insulation boards shall be included. Two third of the height of the test wall shall be covered with base coat and finishing coat.

The upper part of test wall is divided to vertical strips according to number of finishing coats. The maximum number of finishing coats is four (see Figure 2).

6.2 Conditioning of the test wall oSIST prEN 16383:2012

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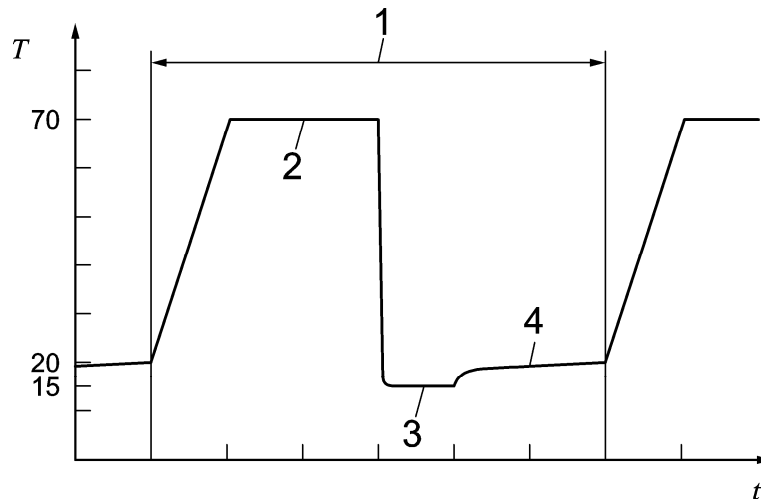
At minimum 28 days at a temperature of $(23 \pm 3)^\circ\text{C}$. If the parties agree, the conditioning can be shorter.

7 Testing the hygrothermal behaviour of the test wall

To test the hygrothermal behaviour of the test wall, following cycles shall be carried out in the following order:

a) 80 cycles heat and rain (see Figure 3):

- heat up the surface of the test wall to $(70 \pm 5)^\circ\text{C}$ at least in 1 h and hold it for at least for 2 h at a relative humidity less than 30 %;
- wet the test wall for 1 h with an amount of more than $1 \text{ l}/(\text{m}^2 \cdot \text{min})$ water at a temperature of $(15 \pm 5)^\circ\text{C}$;
- drain the wall 2 h at a temperature of $(23 \pm 3)^\circ\text{C}$;

**Key**

- 1 1 cycle
- 2 heat
- 3 rain
- 4 drain

T temperature in degrees Celsius

t duration in hours

Figure 3 — Test cycle a) – heat and rain

Conditioning at least 48 h at a temperature of (23 ± 3) °C before starting the cycles b) (heat and cold) and c) (heat, rain, freeze and thaw);

b) 5 cycles heat and cold (see Figure 4):

- heat up the surface of the test wall to (50 ± 5) °C at least in 1 h and hold it for at least 5 h at a relative humidity less than 30 %;
- condition the test wall 2 h in a temperature of (23 ± 3) °C;
- cool the surface of the test wall down in maximum 2 h to (-15 ± 5) °C and maintain this temperature for 14 h (in total 16 h).