
Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje odpornosti sider proti potegu skozi toplotnoizolacijske proizvode

Thermal insulation products for building applications - Determination of the pull-through resistance of plate anchors through thermal insulation products

Wärmedämmstoffe für das Bauwesen - Bestimmung des Durchzugwiderstandes von Tellerdübeln durch Wärmedämmstoffe

Produits isolants thermiques destinés aux applications du bâtiment - Détermination de la résistance au débouffonnage des chevilles à rosace dans les produits isolants thermiques

<https://standards.iteh.ai/catalog/standards/sist/4ca19b4c-8325-4da6-b529-f2da5bc630ff/sist-en-16382-2017>

Ta slovenski standard je istoveten z: EN 16382:2016

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
-----------	---	--

SIST EN 16382:2017

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16382:2017

<https://standards.iteh.ai/catalog/standards/sist/4ca19b4c-8325-4da6-b529-f2da5bc630ff/sist-en-16382-2017>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 16382

October 2016

ICS 91.100.60

English Version

**Thermal insulation products for building applications -
Determination of the pull-through resistance of plate
anchors through thermal insulation products**

Produits isolants thermiques destinés aux applications
du bâtiment - Détermination de la résistance au
déboutonnage des chevilles à rosace dans les produits
isolants thermiques

Wärmedämmstoffe für das Bauwesen - Bestimmung
des Durchzugwiderstandes von Tellerdübeln durch
Wärmedämmstoffe

This European Standard was approved by CEN on 6 August 2016.

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.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

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

Contents

Page

European foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Principle	4
5 Apparatus.....	4
6 Test specimens.....	7
6.1 Thermal insulation product and anchor position	7
6.2 Preparation of the test specimens	8
6.3 Number of test specimens.....	9
7 Procedure.....	9
7.1 Test conditions.....	9
7.2 Attachment of the test specimens to the tensile testing machine	9
7.3 Test procedure	12
8 Calculation and expression of results.....	12
8.1 Failure load	12
8.2 Pull-through resistance F_5 %	13
8.3 Determination of the mean breaking cone.....	14
9 Test report.....	14

European foreword

This document (EN 16382:2016) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

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 April 2017, and conflicting national standards shall be withdrawn at the latest by April 2017.

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.

NOTE It has not been possible to include a statement on the accuracy of measurement in this edition, but it is intended to include such a statement when this European Standard is next revised.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16382:2017

<https://standards.iteh.ai/catalog/standards/sist/4ca19b4c-8325-4da6-b529-f2da5bc630ff/sist-en-16382-2017>

EN 16382:2016 (E)

1 Scope

This European Standard specifies equipment and procedures for determining the pull-through resistance of plate anchors through thermal insulation products.

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 206, *Concrete — Specification, performance, production and conformity*

EN 823, *Thermal insulating products for building applications — Determination of thickness*

EN 1607, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*

EN 1990:2002, *Eurocode — Basis of structural design*

EN ISO 9229, *Thermal insulation — Vocabulary (ISO 9229)*

ISO 12491:1997, *Statistical methods for quality control of building materials and components*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 9229 apply.

4 Principle

SIST EN 16382:2017
<https://standards.iteh.ai/catalog/standards/sist/4ca19b4c-8325-4da6-b529-f2da5bc630ff/sist-en-16382-2017>

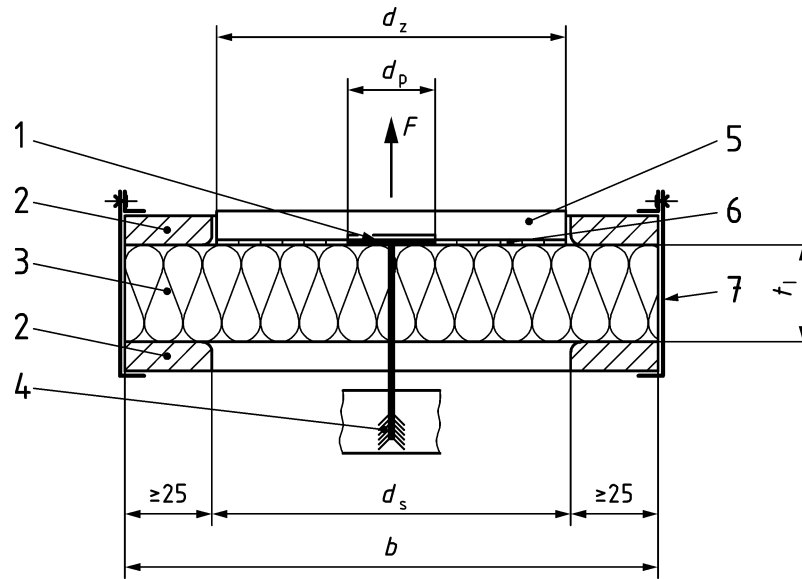
The pull-through resistance of a plate anchor through thermal insulation products is determined by a direct tensile load perpendicular to the surface of the thermal insulation product. The tensile load is applied by means of a tension plate glued to the test area of the thermal insulation product.

5 Apparatus

NOTE In Clause 5, the numbers between brackets refer to Figures 1 to 3.

The plate anchor (1) which is to be tested is pulled through the thermal insulation product (3). The edges of the thermal insulation product are fixed by two square templates with a centric circular opening (2) and clamps (7). The anchor is positioned in the centre of the sample. The circular tension plate (5) is glued (6) onto the thermal insulation product. The anchor is covered previously with a non-adhesive foil. The tension load is introduced to the thermal insulation product by the circular tension plate which fits into the circular opening of the template. The anchorage area of the plate anchor is fixed by a suitable device. The tension load is exerted until failure.

Dimensions in millimetres

**Key**

- 1 plate anchor covered with a suitable non-adhesive foil
- 2 template
- 3 thermal insulation product
- 4 suitable device for fixation the anchorage area of the anchor
- 5 tension plate
- 6 glue
- 7 clamp

- b width of the square template
- d_p diameter of the anchor plate including additional plates if used
- d_s diameter of the circular recess in the template
- d_z diameter of the tension plate
- F tensile load
- t_i thickness of the thermal insulation product

Figure 1 — Principle of the test arrangement

Dimensions in millimetres

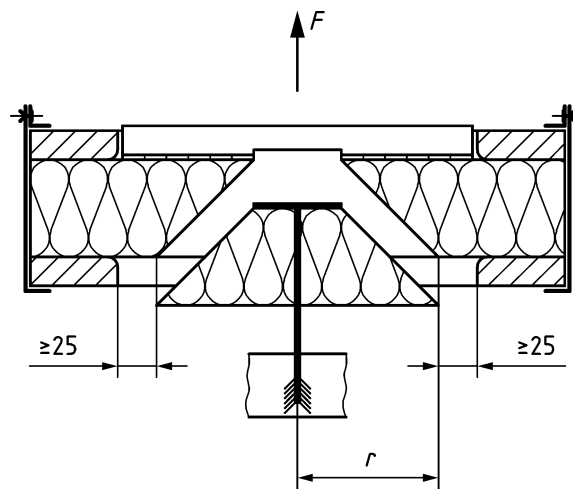
**Key** F tensile load r distance from the centre of the anchor sleeve to the remotest point of the breaking cone

Figure 2 — Schematic presentation of a failure with a breaking cone of the insulation product after pull-through testing

iTeh STANDARD PREVIEW
(standards.iteh.ai)

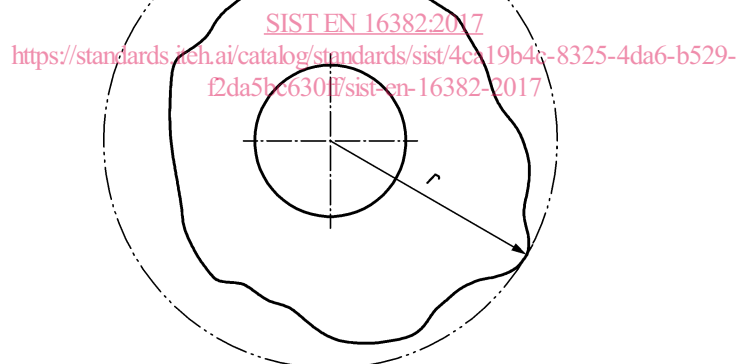
**Key** r distance from the centre of the anchor sleeve to the remotest point of the breaking cone

Figure 3 — Determination of the distance r by a breaking cone

5.1 Glue

The glue shall be suitable for the thermal insulation product and for the tension plate (e.g. solvent-free epoxy or polyurethane based). The glue shall not influence the mechanical properties of the insulation product.

5.2 Template

The square templates with circular openings shall be rigid. Test results are valid if every distance of the circular recess to the breaking cone is at least 25 mm.

NOTE Suitable materials for the template are e.g. laminated wood plates of at least 20 mm thickness or steel plates of at least 7 mm thickness.

The side length b of the templates shall be at least 50 mm larger than the diameter d_s of the circular recess in the template.

The minimum diameter of the circular recess in the template, d_s , is calculated from the diameter of the anchor plate d_p and the thickness of the tested thermal insulation product, t_l , as follows:

$$d_s \geq d_p + 2 \times t_l + 50 \quad (1)$$

where

d_s is the diameter of the circular recess in the template in mm;

d_p is the diameter of the anchor plate including additional plates if used in mm;

t_l is the thickness of the thermal insulation product in mm.

5.3 Clamping device

At least two clamps (7) at each edge are used to fix the thermal insulation product.

5.4 Tension plate

The circular tension plate (5) introduces the load into the thermal insulation product. The tension plate shall be rigid. It shall be connected to the testing machine by a self-alignment device in the centre. The tension plate shall have a diameter of $d_z = d_s - 10$ mm.

NOTE Suitable materials for the tension plate are e.g. laminated wood plates of at least 20 mm thickness or steel plates of at least 7 mm thickness.

5.5 Tensile testing machine

The tensile testing machine needs to be appropriate for the range of force and the displacement involved and capable of having a constant crosshead speed adjusted to (20 ± 1) mm/min. It shall be capable of measuring the force with an error limit of a maximum of 1 % (see EN 1607).

The tensile testing machine shall be capable of continuous recording of load and displacement in order to report load/displacement graphs for all test specimens.

6 Test specimens

6.1 Thermal insulation product and anchor position

The specimen of the thermal insulation product shall be at least as large as the outer dimensions of the template described in 5.2.

To determine the pull-through resistance in the middle area position a specimen without a joint shall be used as shown in Figure 4, a). If the insulation board is smaller than the side length b of the template, the tests shall be performed as shown in Figure 4, c).

To determine the pull-through resistance in joint position a T-joint between three insulation boards is used. The specimen shall be arranged as shown in Figure 4, b).

To determine the pull-through resistance in the edge/corner position a specimen with three insulation boards shall be used as shown in Figure 4, d).