SLOVENSKI STANDARD
oSIST prEN ISO 29766:2021

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Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje natezne trdnosti v smeri dolžine (ISO/DIS 29766:2021)

Thermal insulating products for building applications - Determination of tensile strength parallel to faces (ISO/DIS 29766:2021)

Wärmedämmstoffe für das Bauwesen - Bestimmung der Zugfestigkeit in Plattenebene (ISO/DIS 29766:2021)

Produits isolants thermiques destinés aux applications du bâtiment - Détermination de la résistance à la traction parallèlement aux faces (ISO/DIS 29766:2021)

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

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Thermal insulating products for building applications — Determination of tensile strength parallel to faces

Produits isolants thermiques destinés aux applications du bâtiment — Détermination de la résistance à la traction parallèlement aux faces

ICS: 91.100.60

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 1, *Test and measurement methods,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 88, *Thermal insulating materials and products,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 29766:2008) and the standard EN 1608:2013, which has been technically revised. The main changes compared to the previous edition are as follows:

Clause 6.4 conditioning of test specimen to reflect the conditions for tropical countries;

Clause 7.1 test conditions and

Clause 10 test report

Thermal insulating products for building applications — Determination of tensile strength parallel to faces

1 Scope

This International Standard specifies the equipment and procedures for determining the tensile strength of a product parallel to its faces. This International Standard is applicable to thermal insulating products.

This International Standard can be used to determine whether the product has sufficient strength to withstand stresses during transportation and application.

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.

ISO 29466, *Thermal insulating products for building applications — Determination of thickness*

ISO 29768, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*

ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

3 Terms and definitions

For the purposes of this document, the following term and definition apply.

3.1
tensile strength parallel to faces
σ_t
maximum recorded tensile force parallel to the product faces during the pulling operation, divided by the cross-sectional testing area of the specimen

4 Principle

A specimen is attached to two clamps that are fastened in a tensile testing machine and pulled apart at a given speed.

The maximum tensile force is recorded and the tensile strength of the specimen is calculated.

5 Apparatus

Any test equipment or method which provides the same result with at least the same accuracy may be used.

5.1 Tensile testing machine, appropriate for the range of force and displacement involved, capable of having a constant crosshead speed adjusted to (10 ± 1) mm/min and capable of measuring the force to an accuracy of ± 1 %.

5.2 Two clamps, designed so as to avoid failure of the specimen in the area of the clamps.

The clamps shall be positioned so that the tensile stress is uniformly distributed during the test.

An example of suitable equipment is shown in Figure 1.

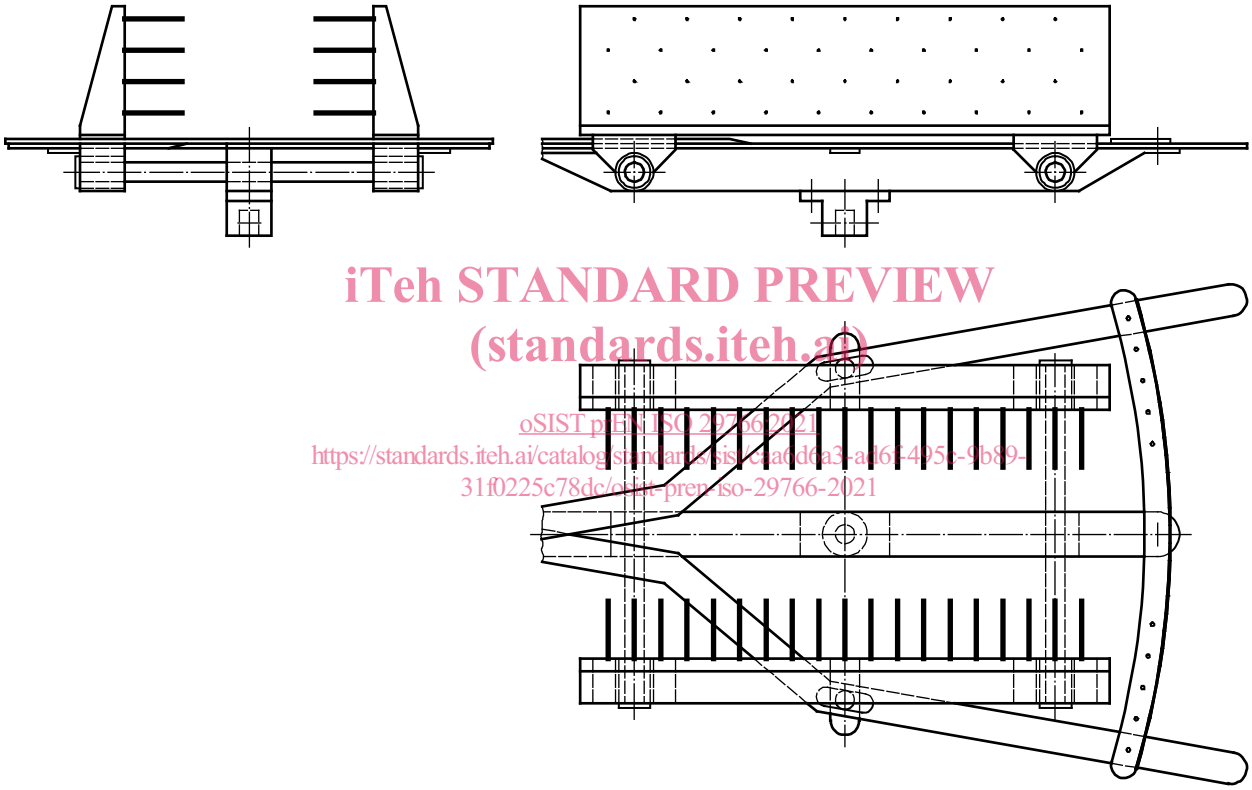


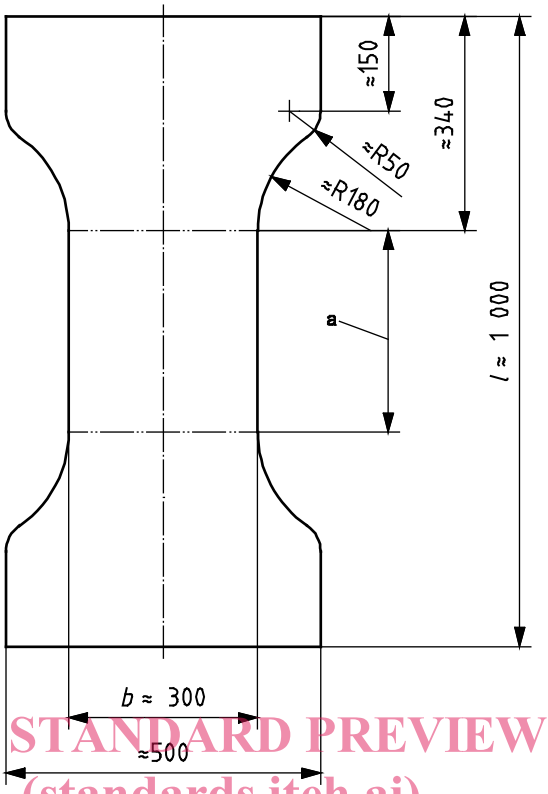
Figure 1 — Example of a suitable clamp

6 Test specimens

6.1 Dimensions of test specimens

The thickness of the specimens shall be the original product thickness including any skins, facings and/or coatings. The specimens shall be cut with the shape and with the dimensions shown in Figure 2. For small products or because of equipment limitations, the specimen length and width shall be adjusted proportionally, but with a minimum length of 500 mm. Other specimen shapes which provide the same result to at least the same accuracy may be used.

Dimensions in millimetres



[a] Testing area.

Figure 2 — Test specimen shape and dimensions

6.2 Number of test specimens

The number of specimens shall be as specified in the relevant product standard. If the number is not specified, then at least three specimens shall be used. In the absence of a product standard or any other international or European technical specification, the number of specimens may be agreed between parties.

6.3 Preparation of test specimens

The specimens shall be cut from the full-size product so that the length direction corresponds to the direction in which the tensile force is applied to the product in its application.

Specimens shall be prepared by methods that do not change the original structure of the product.

NOTE Special methods of preparation, when needed, are given in the relevant product standard or any other international or European technical specification.

6.4 Conditioning of test specimens

The specimens shall be conditioned for at least six hours at (23 ± 5) °C. In case of dispute, they shall be conditioned at (23 ± 2) °C and (50 ± 5) % relative humidity for the time stated in the relevant product standard.

In tropical countries, different conditioning and testing conditions can be relevant. In this case, the conditions shall be 27 °C and 65 % RH and be stated clearly in the test report.

7 Procedure

7.1 Test conditions

Testing shall be carried out at (23 ± 5) °C. In case of dispute, it shall be carried out at (23 ± 2) °C and (50 ± 5) % relative humidity.

In tropical countries, different conditioning and testing conditions can be relevant. In this case, the conditions shall be 27 °C and 65 % RH and be stated clearly in the test report.

7.2 Test procedure

Measure the thickness, d, expressed in millimetres to the nearest millimetre, of the testing area in accordance with ISO 29466.

Measure the length, l, of the specimen and the width, b, of the testing area, both expressed in millimetres to the nearest millimetre, in accordance with ISO 29768.

Attach the specimen centrally between two clamps to distribute the stress uniformly. Place it carefully in the tensile testing machine and increase the tensile force at a constant speed of the crosshead (see 5.1) until failure occurs.

Record the maximum tensile force in kilonewtons.

Record the way in which the product failed. Discard any specimen that fails outside the testing area (see Figure 2).

8 Calculation and expression of results

Calculate the tensile strength, σ_t, expressed in kilopascals, parallel to faces, using Equation (1):

$$\sigma_t = \frac{F_m}{d \times b} \quad (1)$$

where

F_m is the maximum tensile force recorded, expressed in kilonewtons (kN);

d is the thickness of the testing area, expressed in metres;

b is the width of the testing area, expressed in metres.

The result shall be expressed as the mean value of the measurements, expressed to two significant figures.

9 Accuracy of measurement

Following the experience from a “round robin test”, where comparable test equipment and specimen preparation were used, the precision, σ_t, for tensile strength can be estimated as given below.

— 95 % repeatability limit: approximately 3 %;

— 95 % reproducibility limit: approximately 10 %.

The above-mentioned terms are applied in accordance with ISO 5725-1 and ISO 5725-2.

