



SLOVENSKI STANDARD

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Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje obnašanja pri upogibu

Thermal insulating products for building applications - Determination of bending behaviour

Wärmedämmstoffe für das Bauwesen - Bestimmung des Verhaltens bei Biegebeanspruchung

Produits isolants thermiques destinés aux applications du bâtiment - Détermination du comportement en flexion

Ta slovenski standard je istoveten z: EN 12089:2013

ICS:

91.100.60

Materiali za toplotno in
zvočno izolacijo

Thermal and sound insulating
materials

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EUROPEAN STANDARD
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English Version

**Thermal insulating products for building applications -
Determination of bending behaviour**

Produits isolants thermiques destinés aux applications du
bâtiment - Détermination du comportement en flexion

Wärmedämmstoffe für das Bauwesen - Bestimmung des
Verhaltens bei Biegebeanspruchung

This European Standard was approved by CEN on 15 December 2012.

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.

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Foreword

This document (EN 12089:2013) has been prepared by Technical Committee CEN/TC 88 “Thermal insulation 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.

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.

This document supersedes EN 12089:1997.

The revision of this standard contains no major changes, only minor corrections and clarifications of an editorial nature.

This European Standard is one of a series of standards which specify test methods for determining dimensions and properties of thermal insulating materials and products. It supports a series of product standards for thermal insulating materials and products which derive from the Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (Directive 89/106/EEC) through the consideration of the essential requirements.

This European Standard has been drafted for applications in buildings but it may also be used in other areas where it is relevant.

This European test standard is one of the following group of inter-related standards on test methods for determining dimensions and properties of thermal insulation materials and products, all of which come within the scope of CEN/TC 88:

- EN 822, *Thermal insulating products for building applications — Determination of length and width*
- EN 823, *Thermal insulating products for building applications — Determination of thickness*
- EN 824, *Thermal insulating products for building applications — Determination of squareness*
- EN 825, *Thermal insulating products for building applications — Determination of flatness*
- EN 826, *Thermal insulating products for building applications — Determination of compression behaviour*
- EN 1602, *Thermal insulating products for building applications — Determination of the apparent density*
- EN 1603, *Thermal insulating products for building applications — Determination of dimensional stability under constant normal laboratory conditions (23 °C/50 % relative humidity)*
- EN 1604, *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*
- EN 1605, *Thermal insulating products for building applications — Determination of deformation under specified compressive load and temperature conditions*
- EN 1606, *Thermal insulating products for building applications — Determination of compressive creep*

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- EN 1607, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*
- EN 1608, *Thermal insulating products for building applications — Determination of tensile strength parallel to faces*
- EN 1609, *Thermal insulating products for building applications — Determination of short-term water absorption by partial immersion*
- EN 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*
- EN 12086, *Thermal insulating products for building applications — Determination of water vapour transmission properties*
- EN 12087, *Thermal insulating products for building applications — Determination of long-term water absorption by immersion*
- EN 12088, *Thermal insulating products for building applications — Determination of long-term water absorption by diffusion*
- EN 12089, *Thermal insulating products for building applications — Determination of bending behaviour*
- EN 12090, *Thermal insulating products for building applications — Determination of shear behaviour*
- EN 12091, *Thermal insulating products for building applications — Determination of freeze-thaw resistance*
- EN 12429, *Thermal insulating products for building applications — Conditioning to moisture equilibrium under specified temperature and humidity conditions*
- EN 12430, *Thermal insulating products for building applications — Determination of behaviour under point load*
- EN 12431, *Thermal insulating products for building applications — Determination of thickness for floating floor insulating products*
- EN 13793, *Thermal insulating products for building applications — Determination of behaviour under cyclic loading*
- EN 13820, *Thermal insulating materials for building applications — Determination of organic content*

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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.

1 Scope

This European Standard specifies the equipment and procedures for determining the bending behaviour of full size products (Method A) and test specimens (Method B) under the action of three-point loading. It is applicable to thermal insulating products.

The test is designed to determine the bending strength of products and their deflection at a given load.

The method can be used to determine the resistance of the product to bending stresses during transport and application.

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 822, *Thermal insulating products for building applications — Determination of length and width*

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

EN 12085, *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 terms and definitions apply.

3.1

bending strength

σ_b

maximum stress calculated from the maximum force F_m recorded during the bending procedure

3.2

bending stress

σ_x

stress calculated from the force F_x at the deflection X

3.3

deflection

X

vertical displacement of the test specimen at mid span, at the force F_x , measured at the loading edge

4 Principle

The test method consists of applying, at a given speed, a force by means of a loading edge in an axial direction to the faces of a squarely cut rectangular test specimen, which is placed on two support edges. The force is applied to the test specimen at a position midway between the supporting positions (see Figure 1).

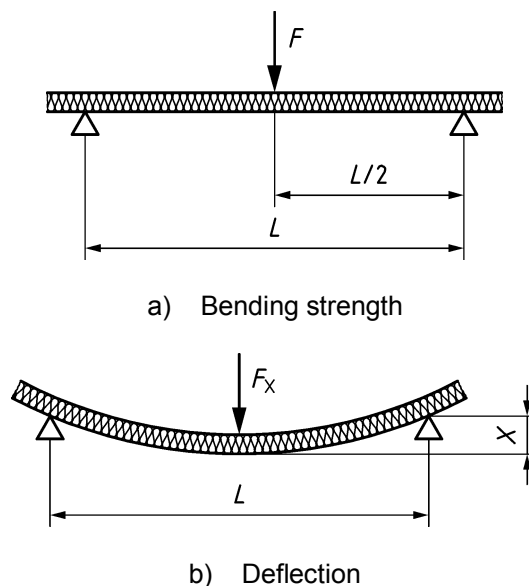


Figure 1 — Principle of test method

5 Apparatus

5.1 Test machine

A test machine suited to the range of force and displacement involved, and with a loading edge and adjustable support edges.

It shall be capable of operating at a constant rate of movement of the movable head.

5.1.1 Support edges

Test specimen supports shall consist of two adjustable cylindrical support edges placed parallel to each other and in the same horizontal plane. The diameter of the supports shall be (80 ± 3) mm or (30 ± 3) mm (see Figure 2). The length of the support edges shall be at least equal to the width of the test specimens.

The span L (see Figure 2) between the support edges shall be adjustable in the range 300 mm to 1 200 mm (method A) or 200 mm to 500 mm (method B).

5.1.2 Loading edge

The test specimen loading edge shall have the same shape and dimensions as the support edges. The loading edge shall be located centrally between and parallel to the supporting edges.

5.1.3 Load distribution plates

For products which may be subject to crushing by the loading and support edges, steel load distribution plates with a thickness of at least 1 mm shall be used. The width of the distribution plates shall be (30 ± 1) mm and their length shall be at least equal to the width of the test specimen.