

## **Ehituses kasutatavad soojustusmaterjalid. Paindeomaduste määramine**

Thermal insulating products for building applications  
- Determination of bending behaviour

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12089:1999 sisaldab Euroopa standardi EN 12089:1997 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12089:1999 consists of the English text of the European standard EN 12089:1997.</p> <p>This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>See standard määrab kindlaks seadmed ja moodused täissuuruses toodete (meetod A) ja proovikehade (meetod B) paindeomaduste määramiseks kolme punktkoormuse mõjul. Standard kehtib soojustustoodete kohta. Teim on ette nähtud toodete paindetugevuse ja läbipainde määramiseks etteantud koormusel. Meetodit saab kasutada toote paindevastupanu määramiseks transpordil ja kasutamisel.</p>	<p><b>Scope:</b></p>
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**ICS** 91.100.60

**Võtmesõnad:** arvutus, hooned, moodus, määramine, paindeteimid, paindetugevus, proovikeha, soojaisolatsioon, soojustusmaterjalid, vastavus

ICS 91.100.99

Descriptors: Thermal insulation, insulating materials, bending strength, testing.

**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 1997-04-26.

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 Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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## Foreword

This European Standard 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 December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

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.

In pursuance of Resolution BT 20/1993 Revised, CEN/TC 88 have proposed defining the standards listed below as a European "package" of standards, setting December 31, 1997 as the date of withdrawal (dow) of national standards which conflict with the European Standards of this package.

The "package" of standards comprises 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

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland 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

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to 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 Definitions

For the purposes of this standard, the following definitions apply:

**3.1 bending strength,  $\sigma_b$ :** The maximum stress calculated from the maximum force  $F_m$  recorded during the bending procedure.

**3.2 bending stress,  $\sigma_x$ :** The stress calculated from the force  $F_x$  at the deflection  $X$ .

**3.3 deflection,  $X$ :** The 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).