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Thermal insulating products for building applications — Determination of thickness for floating floor insulating products

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/540, Energy performance of materials components and buildings.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Thermal insulating products for building applications - Determination of thickness for floating floor insulating products

Produits isolants thermiques destinés aux applications du bâtiment - Détermination de l'épaisseur des produits d'isolation pour sol flottant

Wärmedämmstoffe für das Bauwesen - Bestimmung der Dicke von Dämmstoffen unter schwimmendem Estrich

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

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Foreword

This document (EN 12431:2013) 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.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 12431:1998.

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 interrelated standards on test methods for determining dimensions and properties of thermal insulation materials and products, all of which fall 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*

— 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 thickness of thermal insulating products for impact sound insulation in floating floor applications.

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 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*

3 Terms and definitions

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

3.1
thickness
d_L
thickness of the product under a load of 250 Pa

3.2
thickness
d_F
thickness of the product under a load of 2 kPa

3.3
thickness
d_B
thickness of the product under a load of 2 kPa after application of a short time additional load (48 kPa)

4 Principle

The thickness is determined as the distance measured between a rigid flat base plate on which the test specimen rests and a rigid flat pressure plate exerting different specified pressures on the top surface of the test specimen.

5 Apparatus

5.1 Dial gauge, which permits reading to 0,1 mm, mounted on a rigid frame fastened to a rigid flat base plate.

5.2 Device, with the same accuracy with two readings of the thickness/deformation placed symmetrically on a diagonal on the upper square plate of the device. The mean of these two readings is the thickness/deformation.

5.3 Base plate and pressure plate, which shall be at least as large as the test specimen.

5.4 Device, which exerts a total pressure on the test specimen of (250 $\pm$ 5) Pa (including the force exerted by the dial gauge).

5.5 Device, which exerts a total pressure on the test specimen of (2 000 ± 20) Pa (including the force exerted by the dial gauge).

5.6 Device, which exerts a total pressure on the test specimen of (50 000 ± 500) Pa.

Alternative to 5.1 through 5.6, a compression testing machine suited to the range of force and displacement involved can be used. The compression testing machine shall have two very rigid, polished, square plane parallel plates of which the length of one side is at least as large as the test specimen side to be tested. One of the plates shall be fixed and the other movable, if appropriate, with a centrally positioned knee ball joint to ensure that only axial force is applied to the test specimen.

A device for measuring the displacement shall be fitted to the compression testing machine, which allows measurement of the displacement of the movable plate and which permits a reading to ± 0,1 mm.

A sensor shall be fitted to one of the machine plates to measure the force produced by the reaction of the test specimen upon the plates. This sensor shall be such that its own deformation during the course of the measuring operation is negligible compared with that being measured. If not, it shall be taken to account by calculation. In addition, it shall allow continuous measurement of the force permitting a reading into ± 1 %. When measurements are made on a movable plate and not in the axis, two sensors shall be used placed symmetrically versus the axis. The mean value of the two readings is used.

6 Test specimens

6.1 Dimensions of test specimens

The thickness of the test specimens shall be the original product thickness.

The test specimens shall be squarely cut and square having sides of (200 ± 1) mm.

The length and width shall be determined in accordance with EN 12085, with an accuracy of ± 1 mm.

6.2 Number of test specimens

The number of test specimens shall be as specified in the relevant product standard. If the number is not specified, then ten test specimens shall be used.

In the absence of a product standard or any other European Technical Specification, the number of test specimens may be agreed between parties.

6.3 Preparation of test specimens

The test specimens shall be cut so that they do not include product edges. The test specimens shall be prepared by methods that do not change the original structure of the product. Any skins, facings and/or coatings shall be retained.

6.4 Conditioning of test specimens

The test specimens shall be stored for at least 6 h at (23 ± 5) °C. In case of dispute they shall be stored at (23 ± 2) °C and (50 ± 5) % relative humidity for the time specified in the relevant product standard.

7 Procedure

7.1 Test conditions

The test 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.

7.2 Test procedure

7.2.1 General

Figure 1, below, indicates the procedures to be followed for the determination of the test specimen thicknesses.

7.2.2 Thickness, d_L

Lay the test specimen on the rigid, flat and horizontal base plate ensuring that the measuring area is in contact with the base plate.

Place the test specimens, if faced or coated on one side, with the facing or coating against the base plate.

Load the test specimen with a device exerting a pressure of 250 Pa.

Measure the thickness (120 ± 5) s after placing the pressure plate in position, to the nearest 0,1 mm.

The thickness may be measured with the dial gauge at two diagonally opposite corners or in the centre of the pressure plate or using a measuring device (pin) forced through an opening in the centre of the pressure plate.

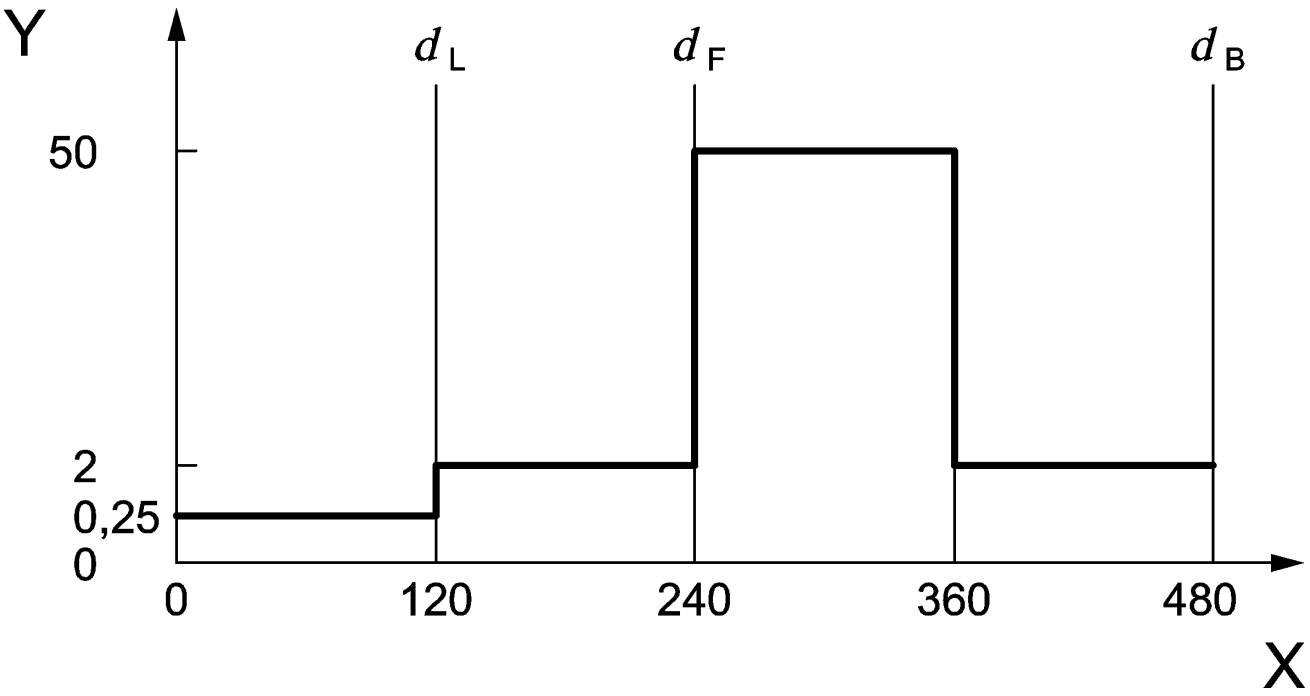
7.2.3 Thickness d_F and d_B

The thicknesses d_F and d_B shall be determined on the same test specimens that were previously used for determining the thickness d_L.

Load the test specimens with a device exerting a pressure of 2 kPa. Measure the thickness d_F (120 ± 5) s after applying this pressure, to the nearest 0,1 mm. Apply an additional pressure of 48 kPa. Remove this additional pressure after (120 ± 5) s.

Measure the thickness d_B to the nearest 0,1 mm (120 ± 5) s or (300 ± 10) s after removing the pressure of 48 kPa. The pause before measuring the thickness, either 120 s or 300 s, shall be as specified in the relevant product standard.

In the absence of a product standard or any other European Technical Specification the pause time may be agreed upon between parties.



Key

X total time, in s
Y load, in kPa

Figure 1 — Illustration of the thicknesses versus time and load

8 Calculation and expression of results

The results for each thickness d_L, d_F and d_B shall be the mean value of the respective measurements made on all test specimens, rounded to the nearest 0,1 mm.

9 Accuracy of measurement

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

10 Test report

The test report shall include the following information:

a) reference to this European Standard;

b) product identification:

   1) product name, factory, manufacturer or supplier;

   2) production code number;

   3) type of product;

   4) packaging;

5) the form in which the product arrived at the laboratory;

6) other information as appropriate, e.g. nominal thickness, nominal density;

c) test procedure:

1) pre-test history and sampling (e.g. who sampled and place of sampling);

2) conditioning;

3) deviation from Clauses 6 and 7, if any;

4) date of testing;

5) number of test specimens;

6) general information relating to the test, e.g. the pause before measuring d_B;

7) events which may have affected the results. Information about the apparatus and identity of the technician should be available in the laboratory, but it need not be recorded in the report;

d) results: all individual values and the mean values of d_L, d_F and d_B.

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