BS EN 823:2013

BSI Standards Publication

Thermal insulating products for building applications — Determination of thickness

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National foreword

This British Standard is the UK implementation of EN 823:2013. It supersedes BS EN 823:1995 which is withdrawn.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 823

March 2013

ICS 91.100.60

Supersedes EN 823:1994

English Version

Thermal insulating products for building applications - Determination of thickness

Produits isolants thermiques destinés aux applications du bâtiment - Détermination de l'épaisseur

Wärmedämmstoffe für das Bauwesen - Bestimmung der Dicke

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

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Foreword

This document (EN 823:2013) 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of an identical text or by endorsement, at the latest by September 2013, and conflicting national standards shall be withdrawn at the latest by September 2013.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 823:1994.

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 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 (89/106/EEC) through the consideration of the essential requirements.

This European Standard gives the reference method. Other methods may be used (e.g. for quality control), provided a correlation has been established with this reference method; Annex B gives some examples of such methods.

This European standard has been drafted for applications in building 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 full-size products. It is applicable to thermal insulating products.

2 Normative references

This European Standard contains no normative references.

3 Terms and definitions

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

3.1
thickness
d
linear dimension measured perpendicularly to the length and width plane

4 Principle

The distance is measured between a hard flat reference surface on which the test specimen rests and a pressure plate resting freely on the top face of the test specimen.

5 Apparatus

5.1 Measuring device, comprising a dial gauge and a square pressure plate.

An example of a suitable apparatus is given in Figure 1.

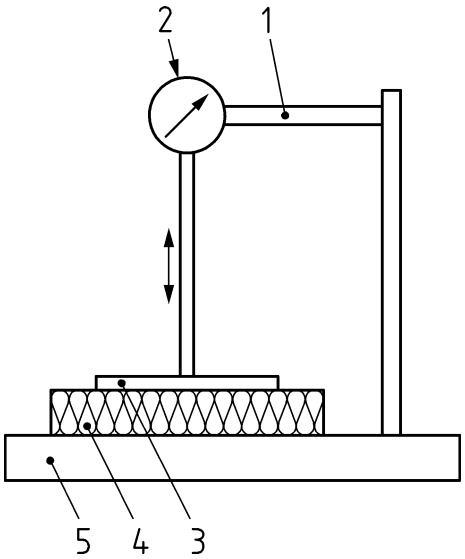
5.1.1 Dial gauge, capable of measuring to an accuracy of at least 0,5 mm[1)] and mounted on a rigid frame fastened to a flat rigid base plate which is at least as large as the test specimen.

5.1.2 Pressure plate, 200 mm square, which exerts a total pressure on the test specimen of either (50 ± 1,5) Pa or (250 ± 5) Pa (including the force exerted by the dial gauge).

The pressure shall be as given in the relevant product standard.

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

1) If a higher accuracy is required, it is specified in the relevant product standard or agreed between parties.



Key

1 rigid frame
2 dial gauge
3 square pressure plate
4 test specimen
5 flat rigid base plate

Figure 1 — Example of suitable apparatus for determining the thickness

6 Test specimens

6.1 Dimensions of test specimens

The test specimen shall be the full-size product, but it may be necessary to cut the product into pieces of appropriate size.

6.2 Number of test specimens

The number of test specimens shall be as specified in the relevant product standard.

In the absence of a product standard, the number of test specimens may be agreed between parties.

6.3 Conditioning of test specimens

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

6.4 Preparation of test specimens

Any facings or coatings shall be retained.

For compressed products, the preparation of test specimens shall be in accordance with Annex A.

7 Procedure

7.1 Test conditions

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

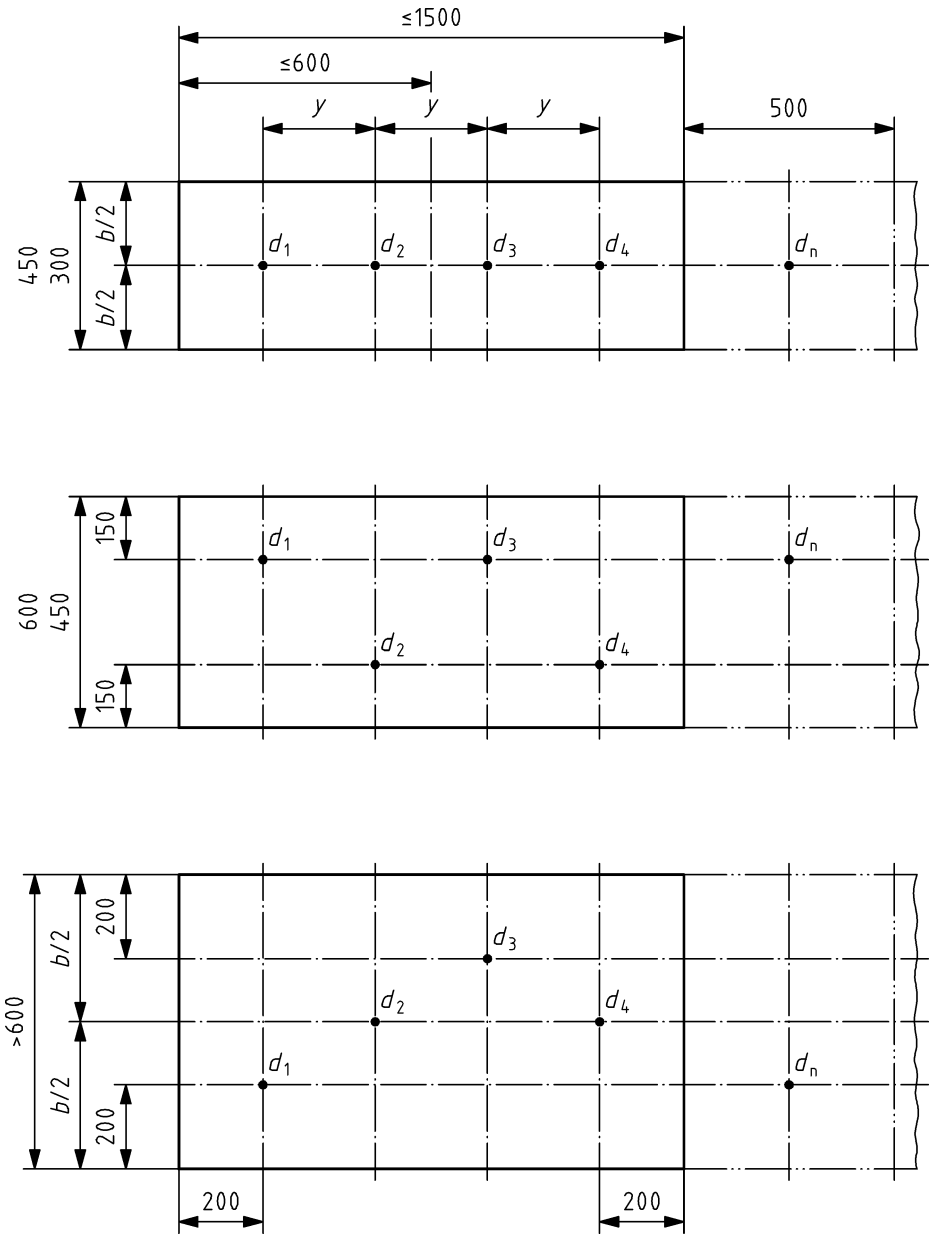
7.2 Test procedure

Lay the test specimen carefully on the flat rigid base plate, ensuring that the measuring area is in contact with the base plate. Test specimens faced or coated on one side shall be placed with the facing or coating against the base plate. Place the pressure plate on the test specimen, exerting a total pressure of either (50 ± 1,5) Pa or (250 ± 5) Pa at a designated position with the dial gauge centrally located.

Take two measurements for test specimens of lengths less than or equal to 600 mm, four measurements for test specimens greater than 600 mm and less than or equal to 1 500 mm in length, and one additional measurement for each additional 500 mm exceeding 1 500 mm in length.

Take the measurements d_1, d_2, ... and d_n at positions on the surface, as shown in Figure 2.

Measure to an accuracy in accordance with 5.1.



Key

b	width
d_1, d_2 ...d_n	measurement positions on the surface

Figure 2 — Positions for measurements

8 Calculation and expression of results

The thickness of the test specimen shall be expressed in millimetres, to the nearest millimetre, as the mean value of the measurements made at all the points for the test specimen (see Figure 2)[1)].

9 Accuracy of measurement

NOTE It has not been possible to include a statement of the accuracy of the method 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 density;

c) test procedure:

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

   2) conditioning;

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

   4) date of test;

   5) general information relating to the test including the pressure;

   6) any occurrences 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 value.

Annex A
(normative)

Preparation of test specimens for compressed products

Before thickness measurements are taken, products which have been compressed in the package, and which in the package have a thickness less than 90 % of the nominal thickness, shall be prepared in accordance with a) to d).

Roll insulation shall be completely unrolled and cut into pieces, 1 m to 1,5 m long. The first and last 0,5 m length of roll shall be discarded.

a) Hold the piece vertically in both hands by a long edge so that the other long edge is approximately 450 mm above the floor.

b) Drop the piece once so that it strikes the floor.

c) Repeat operations a) and b) on the opposite edge for all test specimens in the package and for all pieces cut from a roll.

d) Wait at least 5 min for the pieces to reach a state of equilibrium before taking any measurements.

Annex B
(normative)

Examples of other methods for the determination of thickness

B.1 Pin-and-plate method

B.1.1 General

This method gives the same results with the same accuracy as the reference method, but only for those products which can be penetrated by the pin without changing the thickness of the product (see the relevant product standard).

B.1.2 Apparatus

The measuring equipment consists of a pressure plate, a pin and a metal rule.

B.1.2.1 Pressure plate made from a transparent plastic or other suitable material, 200 mm square, and fitted with a suitable thumb grip.

The total mass of the plate and the grip shall be within the range 198 g to 210 g so that it exerts a pressure of (50 ± 1,5) Pa (see Figure B.1).

B.1.2.2 Pin made from a 3 mm diameter steel rod and of sufficient length to penetrate the full thickness of the test specimen (see Figure B.2), with 20 mm of one end sharpened to a point.

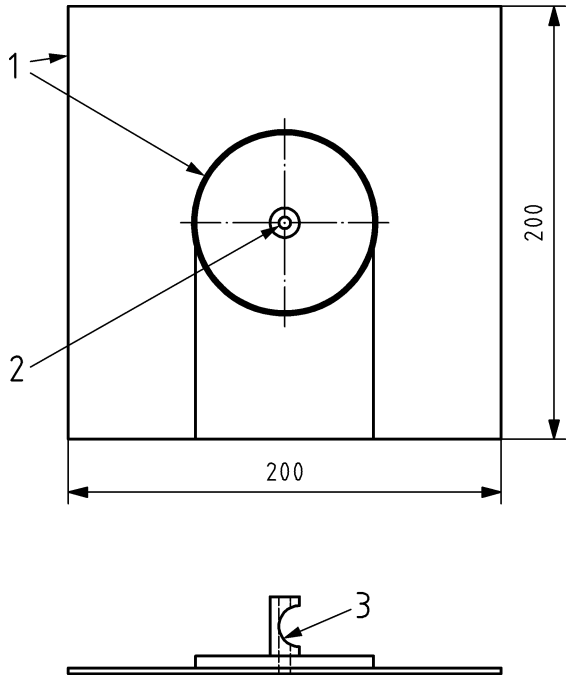
B.1.2.3 Metal rule, graduated in millimetres to permit readings to an accuracy of 0,5 mm.

B.1.3 Procedure

Place the pressure plate on the designated measuring point, lowering it slowly, exerting a total pressure of (50 ± 1,5) Pa. Force the pin with a rotary motion vertically downward through the test specimen to the surface below.

Grasp the pin firmly at the thumb grip and remove both the pin and the plate. Measure the distance from the point of the pin to the plate. This distance is the thickness of the test specimen at this point.

Dimensions in millimetres



Mass between 198 g and 210 g ((50 t 1,5) Pa)

1 rigid plate

2 hole diameter suitable for sliding pin perpendicular to plate

3 thumb grip

Figure B.1 — Pressure plate

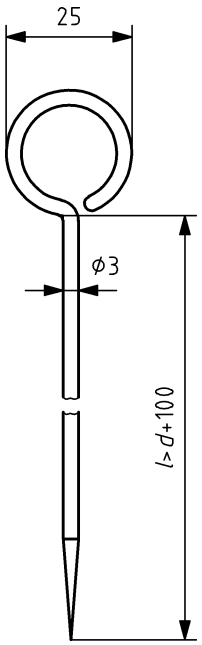


Figure B.2 — Pin

B.2 Dial gauge method

B.2.1 General

This method is applicable to rigid cellular foam products. It uses a dial gauge with a small contact plate which allows the detection of variations in thickness that can occur over small distances.

B.2.2 Apparatus

B.2.2.1 Dial gauge, with an accuracy of at least 0,05 mm with a circular contact plate having an area of (650 ± 50) mm^2 equivalent to a diameter of $(28{,}8 \pm 1)$ mm and exerting a pressure of $(50 \pm 1{,}5)$ Pa or (250 ± 5) Pa.

B.2.3 Procedure

Take measurements at designated positions.

Product standards may specify alternative positions to those given in Figure 2 of this standard (position for measurement). For example, a large number of measurements may be required across the width of a board. It may be necessary to cut a board to get access to all points where a measurement is required.

B.3 Vernier caliper method

B.3.1 General

This method is suitable for some rigid products and for certain applications as the accuracy corresponds sufficiently to the product tolerances (see the relevant product standard).

As an example, vernier calipers may be used to measure the thickness of wood wool slabs or wood wool multilayer slabs.

B.3.2 Apparatus

B.3.2.1 **Vernier caliper** having a leg length commensurate with the products being measured and, where appropriate, equipped with contact plates.

The accuracy of the vernier caliper depends on the leg length.

B.3.3 Procedure

Take measurements at designated positions.

Product standards may specify alternative positions to those given in Figure 2 of this standard (position for measurement). For example, a large number of measurements may be required across the width of a board. It may be necessary to cut a board to get access to all points where a measurement is required.

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