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**Thermal insulating products for building  
applications — Determination of  
thickness**

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

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Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 29466 was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 1, *Test and measurement methods*.

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## Introduction

This International Standard comprises the original EN 823:1994 prepared by Technical Committee CEN/TC 88, *Thermal insulating materials and products*, which has been amended by ISO/TC 163/SC 1 with reference to conditioning and testing conditions in tropical countries.

This International Standard is one of a series of documents specifying test methods, based on existing European Standards, that are being adopted by ISO. This “package” of standards includes the following group of interrelated documents.

International Standard	Respective EN standard
ISO 29465, <i>Thermal insulating products for building applications — Determination of length and width</i>	EN 822
ISO 29466, <i>Thermal insulating products for building applications — Determination of thickness</i>	EN 823
ISO 29467, <i>Thermal insulating products for building applications — Determination of squareness</i>	EN 824
ISO 29468, <i>Thermal insulating products for building applications — Determination of flatness</i>	EN 825
ISO 29469, <i>Thermal insulating products for building applications — Determination of compression behaviour</i>	EN 826
ISO 29470, <i>Thermal insulating products for building applications — Determination of the apparent density</i>	EN 1602
ISO 29471, <i>Thermal insulating products for building applications — Determination of dimensional stability under constant normal laboratory conditions (23°C/50 % relative humidity)</i>	EN 1603
ISO 29472, <i>Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions</i>	EN 1604
ISO 29764, <i>Thermal insulating products for building applications — Determination of deformation under specified compressive load and temperature conditions</i>	EN 1605
ISO 29765, <i>Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces</i>	EN 1607
ISO 29766, <i>Thermal insulating products for building applications — Determination of tensile strength parallel to faces</i>	EN 1608
ISO 29767, <i>Thermal insulating products for building applications — Determination of short-term water absorption by partial immersion</i>	EN 1609
ISO 29768, <i>Thermal insulating products for building applications — Determination of linear dimensions of test specimens</i>	EN 12085
ISO 29769, <i>Thermal insulating products for building applications — Determination of behaviour under point load</i>	EN 12430

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ISO 29770, <i>Thermal insulating products for building applications — Determination of thickness for floating-floor insulating products</i>	EN 12431
ISO 29771, <i>Thermal insulating materials for building applications — Determination of organic content</i>	EN 13820
ISO 29803, <i>Thermal insulation products for building applications — Determination of the resistance to impact of external thermal insulation composite systems (ETICS)</i>	EN 13497
ISO 29804, <i>Thermal insulation products for building applications — Determination of the tensile bond strength of the adhesive and of the base coat to the thermal insulation material</i>	EN 13494
ISO 29805, <i>Thermal insulation products for building applications — Determination of the mechanical properties of glass fibre meshes</i>	EN 13496

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# Thermal insulating products for building applications — Determination of thickness

## 1 Scope

This International Standard specifies the equipment and procedures for determining the thickness of full-size products. It is applicable to thermal insulating products.

## 2 Terms and definitions

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

### 2.1

#### **thickness**

*d*

linear dimension measured perpendicularly to the length and width plane

## 3 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 specimen.

## 4 Apparatus

### 4.1 Measuring device, comprised of

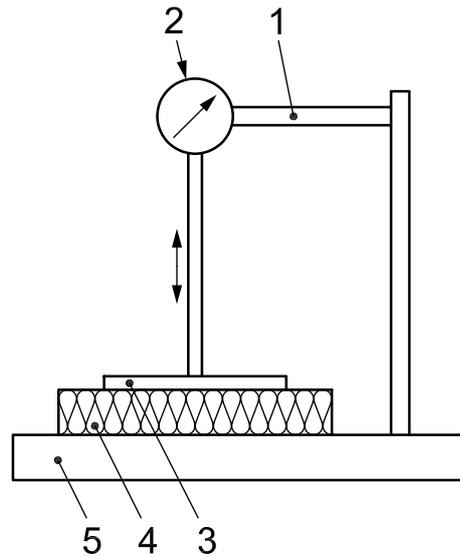
- a) a dial gauge, capable of measuring to an accuracy of at least 0,5 mm and mounted on a rigid frame fastened to a flat rigid base plate that is at least as large as the test specimen; and
- b) a square pressure plate, 200 mm square, which exerts a total pressure on the test specimen of either  $(50 \pm 1,5)$  Pa or  $(250 \pm 5)$  Pa (including the force exerted by the dial gauge).

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

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

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

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



**Key**

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

**Figure 1 — Example of an apparatus suitable for determining the thickness**

**5 Test specimens**

**5.1 Dimensions of test specimens**

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

**5.2 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 upon.

**5.3 Conditioning of test specimens**

The test specimens shall be stored for at least 6 h at  $(23 \pm 5) ^\circ\text{C}$ . In cases of dispute, they shall be stored at  $(23 \pm 2) ^\circ\text{C}$  and  $(50 \pm 5) \%$  relative humidity for the time specified in the relevant product standard.

In tropical countries, different conditioning and testing conditions can be relevant. In this case, the conditions shall be  $27 ^\circ\text{C}$  and  $65 \%$  RH and be stated clearly in the test report.

**5.4 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.

## 6 Procedure

### 6.1 Test conditions

The test shall be carried out at  $(23 \pm 5)$  °C. In case of dispute, it shall be carried out at  $(23 \pm 2)$  °C and  $(50 \pm 5)$  % 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.

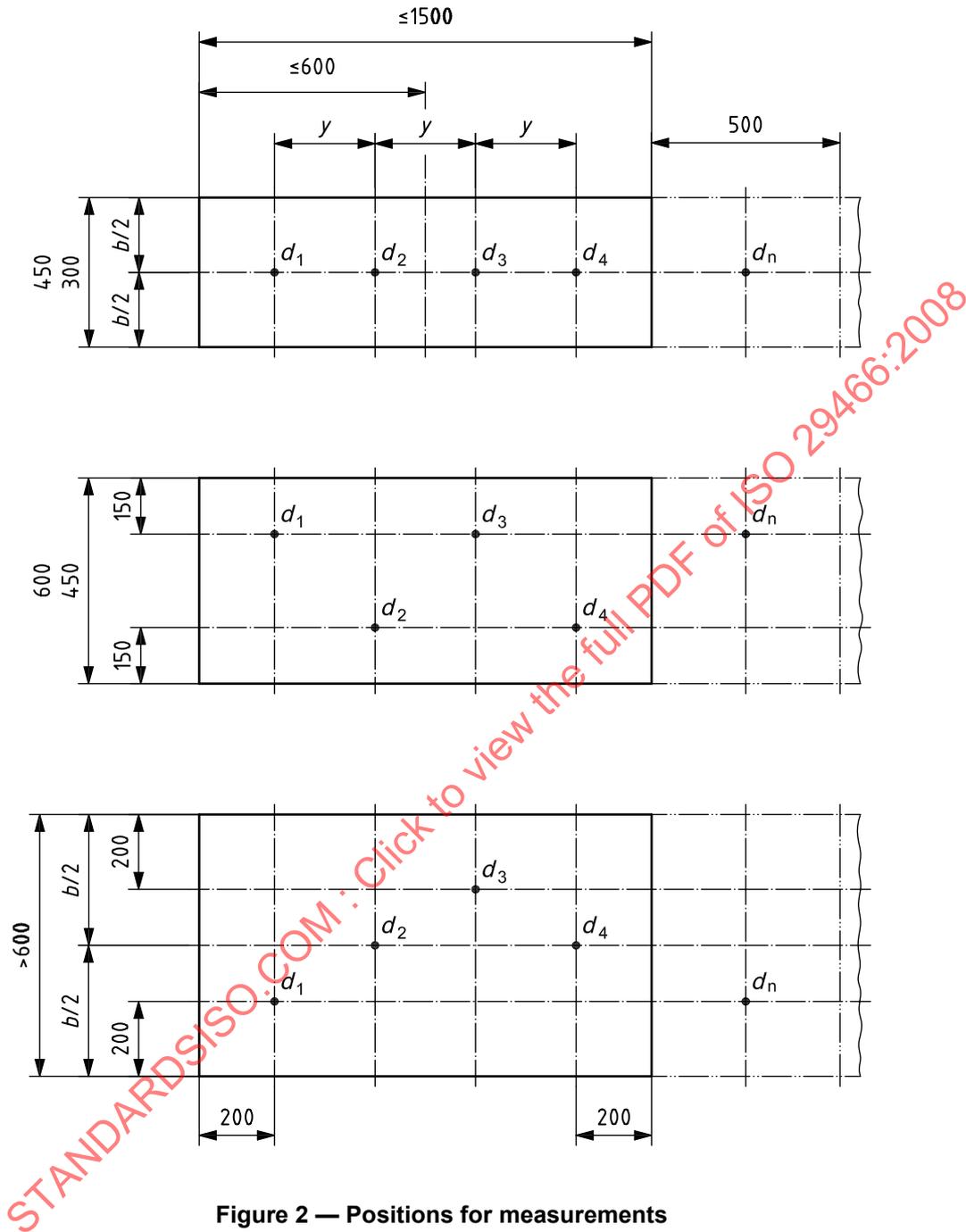
### 6.2 Test procedure

Lay the test specimen carefully on the baseplate, ensuring that the measuring area is in contact with the baseplate. Test specimens faced or coated on one side shall be placed with the facing or coating against the baseplate. Place the pressure plate on the specimen, exerting a total pressure of either  $(50 \pm 1,5)$  Pa or  $(250 \pm 5)$  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  $d_1, d_2, \dots$  and  $d_n$  at positions on the surface, as shown in Figure 2.

Measure to an accuracy in accordance with 4.1.



## 7 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).

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

## 8 Accuracy of measurement

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

## 9 Test report

The test report shall include the following information:

- a) reference to this International Standard;
- b) product identification:
  - 1) product name, factory, manufacturer or supplier,
  - 2) production code number,
  - 3) type of product,
  - 4) packaging,
  - 5) 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 (name of person taking the samples and sampling site),
  - 2) conditioning,
  - 3) deviations from Clauses 5 and 6, if any,
  - 4) conditioning and testing conditions in tropical countries, if applicable,
  - 5) date of test,
  - 6) general information relating to the test including the pressure,
  - 7) any occurrences that can have affected the results;
- d) results: all individual values and the mean value.

NOTE It is expected that information about the apparatus and identity of the technician be available in the laboratory, but it is not necessary that it be recorded in the report.

## Annex A (normative)

### Preparation of test specimens for compressed products

Before thickness measurements are taken, products that have been compressed in the package, and which in the package have a thickness of 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 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.

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