INTERNATIONAL STANDARD

ISO 29768

First edition
2008-11-01

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

Produits isolants thermiques destinés aux applications du bâtiment — Détermination des dimensions linéaires des éprouvettes d'essai

Reference number
ISO 29768:2008(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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 29768 was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 1, *Test and measurement methods*.

Introduction

This International Standard comprises the original EN 12085:1997 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, *Thermal insulating products for building applications — Determination of length and width*	EN 822
ISO 29466, *Thermal insulating products for building applications — Determination of thickness*	EN 823
ISO 29467, *Thermal insulating products for building applications — Determination of squareness*	EN 824
ISO 29468, *Thermal insulating products for building applications — Determination of flatness*	EN 825
ISO 29469, *Thermal insulating products for building applications — Determination of compression behaviour*	EN 826
ISO 29470, *Thermal insulating products for building applications — Determination of the apparent density*	EN 1602
ISO 29471, *Thermal insulating products for building applications — Determination of dimensional stability under constant normal laboratory conditions (23 °C/50 % relative humidity)*	EN 1603
ISO 29472, *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*	EN 1604
ISO 29764, *Thermal insulating products for building applications — Determination of deformation under specified compressive load and temperature conditions*	EN 1605
ISO 29765, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*	EN 1607
ISO 29766, *Thermal insulating products for building applications — Determination of tensile strength parallel to faces*	EN 1608
ISO 29767, *Thermal insulating products for building applications — Determination of short-term water absorption by partial immersion*	EN 1609

ISO 29768, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*	EN 12085
ISO 29769, *Thermal insulating products for building applications — Determination of behaviour under point load*	EN 12430
ISO 29770, *Thermal insulating products for building applications — Determination of thickness for floating-floor insulating products*	EN 12431
ISO 29771, *Thermal insulating materials for building applications — Determination of organic content*	EN 13820
ISO 29803, *Thermal insulation products for building applications — Determination of the resistance to impact of external thermal insulation composite systems (ETICS)*	EN 13497
ISO 29804, *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*	EN 13494
ISO 29805, *Thermal insulation products for building applications — Determination of the mechanical properties of glass fibre meshes*	EN 13496

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

1 Scope

This International Standard specifies the characteristics and choice of measuring equipment and the procedure for determining the linear dimensions of test specimens that are taken from thermal insulating products. The procedures for measuring the dimensions of full-size products are specified in ISO 29465 and ISO 29466.

2 Terms and definitions

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

2.1
linear dimension
distance between two points, between two parallel lines or between two parallel planes, defined by corners, edges or surfaces of the test specimen

2.2
test specimen
single item or part of an item used for a test

3 Principle

The linear dimensions of a test specimen are measured using an apparatus giving the required degree of accuracy.

4 Apparatus

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

4.1 **Flat surface**, larger than the largest dimensions of the test specimen.

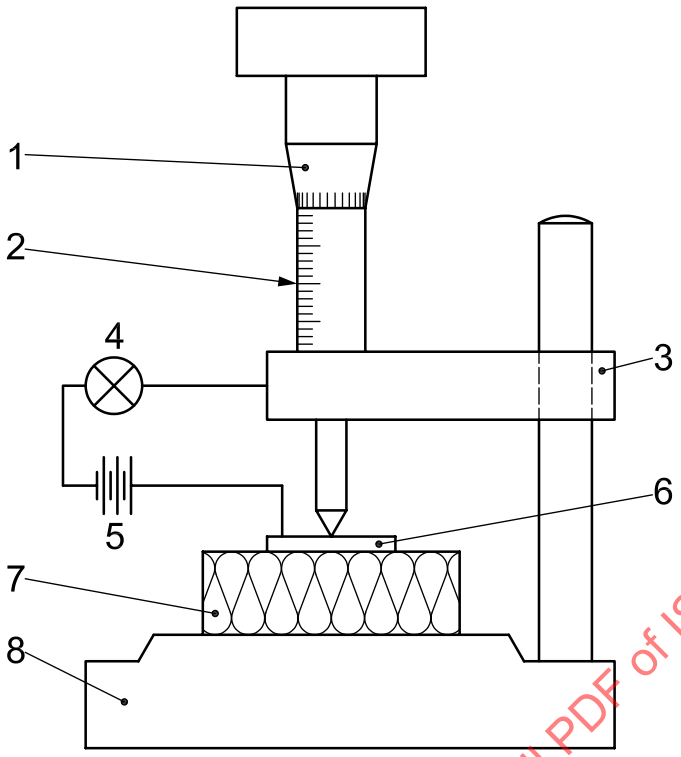
4.2 **Dial gauge**, permitting reading to at least 0,05 mm.

The measuring surface shall be of such a size that the total resultant measuring pressure $\leqslant$ 1 kPa.

NOTE The measuring pressure of the dial gauge can be reduced by removing the spring. The dial gauge, or any other electrical or optical measuring instrument having at least the same accuracy, can be fixed to a device to adapt the testing equipment to the size of the test specimen.

4.3 **Micrometer**, permitting readings to at least 0,05 mm.

A micrometer shall be used only if it incorporates a device that indicates the onset of the force applied by the micrometer when it contacts the test specimen surface. An example of such a device is an electrical circuit, consisting of a flexible wire, battery, lamp and an aluminium plate exerting a pressure of (50 $\pm$ 1,5) Pa on the test specimen, as shown in Figure 1.



Key

1 screw micrometer
2 millimetre scale
3 adjustable support
4 lamp
5 battery
6 aluminium plate, 10 cm^2
7 test specimen
8 base plate

Figure 1 — Example of a suitable micrometer

4.4 Sliding caliper, permitting readings to at least 0,1 mm.

The sliding caliper shall be used only if it does not cause any deformation of the test specimen.

4.5 Metal rule or **metal tape**, graduated in millimetres and permitting reading to at least 0,5 mm.

5 Test specimens

The number, dimensions and conditioning of test specimens shall be as defined in the relevant test method standard or any other international or European technical specification.

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 Procedure

6.1 Test conditions

The test conditions shall be as defined in the relevant test method standard or any other international or European technical specification.

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 Choice of measuring equipment

The choice of measuring equipment shall be in accordance with the required accuracy of the measured value as given in the relevant test method standard or any other international or European technical specification. Where no such standard or specification exists, the required accuracy shall be agreed between parties, but it shall correspond to the dimensions being measured.

If the required accuracy of the dimension is expressed in millimetres, the choice of the equipment shall be as shown in Table 1.

Table 1 — Required accuracy expressed in millimetres

Required accuracy mm	Measuring equipment	Readings to the nearest mm	Median of readings at each position rounded to the nearest mm
0,1	dial gauge or micrometer [a]	0,05	0,1
0,2	sliding caliper [b]	0,1	0,2
1,0	metal tape or rule [c]	0,5	1,0

[a] A dial gauge shall be used only if the result is unaffected by dial gauge pressure up to 1 kPa.

[b] A dial gauge or a micrometer may also be used, but then it is not necessary for the instrument accuracy to be better than that of a sliding caliper.

[c] A sliding caliper or even a dial gauge or micrometer may be used, but then it is not necessary for the instrument accuracy to be better than that of the metal tape or rule.

Table 2 shall be used to provide the means for the selection of the equipment used where the accuracy is expressed in percentage terms. The choice depends on both the required accuracy and on the test specimen's dimensions.

Table 2 — Required accuracy expressed in percent

Required accuracy %	Measuring equipment/range of dimensions		
	20 mm to < 50 mm	50 mm to ⩽ 100 mm	> 100 mm
0,5 to < 1	dial gauge or micrometer [a]	sliding caliper [b]	metal tape or rule [c]
1 to < 2	sliding caliper [b]	sliding caliper [b]	metal tape or rule [c]
⩾ 2	sliding caliper [b]	metal tape or rule [c]	metal tape or rule [c]

[a] A dial gauge shall be used only if the result is unaffected by dial gauge pressure up to 1 kPa.

[b] A dial gauge or a micrometer may also be used, but then it is not necessary for the instrument accuracy to be better than that of a sliding caliper.

[c] A sliding caliper or even a dial gauge or micrometer may be used, but then it is not necessary for the instrument accuracy to be better than that of the metal tape or rule.

6.3 Number and location of measurements

The number of the measuring locations shall depend on the size and the shape of the test specimen, but shall be at least two. The locations shall be as widely separated as possible, in order to give a good mean value.

If the median of three readings at each position is taken, the mean shall be calculated from the two or more median values.

NOTE The median value at each position is taken because it is easier to keep in mind the majority of the measured values instead of noting all single values and calculating the mean value.

6.4 Measurement with dial gauge

The measurement shall be made with the test specimen placed on a flat surface.

The measurements shall be made with and without the test specimen. The difference between the two measurements gives one reading.

All readings shall be made to the nearest 0,05 mm. The mean value calculated shall be rounded to the nearest 0,1 mm.

6.5 Measurement with micrometer

The measurement shall be made with the test specimen placed on a flat surface. The micrometer shall be fixed to an adjustable support (see Figure 1). The measuring point of the micrometer shall be screwed down continuously until it just touches the test specimen, as indicated by the surface contact device.

The measurements shall be made with and without the test specimen. The difference between the two measurements gives one reading.

All readings shall be made to the nearest 0,05 mm. The mean value calculated shall be rounded to the nearest 0,1 mm.

6.6 Measurement with a sliding caliper

The caliper shall be progressively preset to smaller measurements and presented to the test specimen until the setting is reached when the caliper measuring faces just touch the surface of the test specimen without causing any deformation.

All readings shall be made to the nearest 0,1 mm. The mean value calculated shall be rounded to the nearest 0,2 mm.

6.7 Measurement with metal rule or metal tape

The test specimen shall not be distorted or damaged by the application of the metal rule or metal tape.

All readings shall be made to the nearest 0,5 mm. The mean value calculated shall be rounded to the nearest 1 mm.

7 Calculation and expression of results

The calculation of results shall be as defined in Clause 6.

8 Accuracy of measurement

NOTE It has not been possible to include a statement of the accuracy of measurement 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 be as defined in the relevant test method standard, noting, if applicable, the use of the conditioning and testing conditions for tropical countries.