

SLOVENSKI STANDARD
oSIST prEN ISO 29470:2019
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Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje prostorninske mase (ISO/DIS 29470:2019)

Thermal insulating products for building applications - Determination of the apparent density (ISO/DIS 29470:2019)

Wärmedämmstoffe für das Bauwesen - Bestimmung der Rohdichte (ISO/DIS 29470:2019)

Produits isolants thermiques destinés aux applications du bâtiment -- Détermination de la masse volumique apparente (ISO/DIS 29470:2019)

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17.060	Merjenje prostornine, mase, gostote, viskoznosti	Measurement of volume, mass, density, viscosity
91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials

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Thermal insulating products for building applications — Determination of the apparent density

Produits isolants thermiques destinés aux applications du bâtiment — Détermination de la masse volumique apparente

ICS: 91.100.60

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Apparatus	1
6 Test specimens	2
6.1 Dimensions of test specimens.....	2
6.2 Number of test specimens.....	2
6.3 Preparation of test specimens.....	2
6.4 Conditioning of test specimens.....	2
7 Procedure	3
7.1 Test conditions.....	3
7.2 Test procedure.....	3
8 Calculation and expression of results	3
9 Accuracy of the measurement	3
10 Test report	4

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ISO/DIS 29470:2019(E)

Foreword

This EN ISO/FDIS 29470 includes the original EN 1602:1996 and EN 1602:1996/AC:1997 test methods prepared by Technical Committee CEN/TC 88 "Thermal insulating materials and products" in cooperation with ISO TC 61 SC 10 and under the CEN lead by CEN TC 88 WG 1, being modified in the following chapters:

[Clause 6.4](#) conditioning of test specimen;

[Clause 7.1](#) test conditions and

[Clause 10](#) test report

to reflect the conditions for tropical countries.

The standard also includes the ISO 845 as published by ISO TCX 61 SC 10. The standard is identical to the technical content of EN 1602.

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.

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This ISO/FDIS 29470 is one of a series of existing European Standards on test methods which shall be adopted by ISO. This "package" of standards comprises the following group of interrelated standards:

ISO/FDIS	Title	respective EN standard
12344	Thermal insulating products for building applications - Determination of bending behaviour	EN 12089
12968	Thermal insulation products for building applications - Determination of the pull-off resistance of external thermal insulation composite systems (ETICS) (foam block test)	EN 13495
29465	Thermal insulating products for building applications - Determination of length and width	EN 822
29466	Thermal insulating products for building applications - Determination of thickness	EN 823
29467	Thermal insulating products for building applications - Determination of squareness	EN 824
29468	Thermal insulating products for building applications - Determination of flatness	EN 825

29469	Thermal insulating products for building applications - Determination of compression behaviour	EN 826
29470	Thermal insulating products for building applications - Determination of the apparent density	EN 1602
29471	Thermal insulating products for building applications - Determination of dimensional stability under constant normal laboratory conditions (23°C/50 % relative humidity)	EN 1603
29472	Thermal insulating products for building applications - Determination of dimensional stability under specified temperature and humidity conditions	EN 1604
29764	Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature conditions	EN 1605
29765	Thermal insulating products for building applications - Determination of tensile strength perpendicular to faces	EN 1607
29766	Thermal insulating products for building applications - Determination of tensile strength parallel to faces	EN 1608
29767	Thermal insulating products for building applications - Determination of short term water absorption by partial immersion	EN 1609
29768	Thermal insulating products for building applications - Determination of linear dimensions of test specimens	EN 12085
29769	Thermal insulating products for building applications - Determination of behaviour under point load	EN 12430
29770	Thermal insulating products for building applications - Determination of thickness for floating floor insulating products	EN 12431
29771	Thermal insulating materials for building applications - Determination of organic content	EN 13820
29803	Thermal insulation products for building applications - Determination of the resistance to impact of external thermal insulation composite systems (ETICS)	EN 13497
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
29805	Thermal insulation products for building applications - Determination of the mechanical properties of glass fibre meshes	EN 13496
ISO 16534	Thermal insulating products for building applications - Determination of compressive creep	EN 1606
ISO 16535	Thermal insulating products for building applications - Determination of long term water absorption by immersion	EN 12087
ISO 16536	Thermal insulating products for building applications - Determination of long term water absorption by diffusion	EN 12088
ISO 16537	Thermal insulating products for building applications - Determination of shear behaviour	EN 12090

ISO/DIS 29470:2019(E)

ISO 16546	Thermal insulating products for building applications - Determination of freeze-thaw resistance	EN 12091
ISO 16544	Thermal insulating products for building applications – Conditioning to moisture equilibrium under specified temperature and humidity conditions	EN 12429
ISO 16545	Thermal insulating products for building applications - Determination of behaviour under cyclic loading	EN 13793

A further package of existing European Standards on test methods for products used to insulate building equipment and industrial installations comprises the following group of interrelated standards:

ISO 12623	Thermal insulation products for building equipment and industrial installations - Determination of short-term water absorption by partial immersion of preformed pipe insulation	EN 13472
ISO 12624	Thermal insulation products - Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH	EN 13468
ISO 12628	Thermal insulation products for building equipment and industrial installations - Determination of dimensions, squareness and linearity of preformed pipe insulation	EN 13467
ISO 12629	Thermal insulation products for building equipment and industrial installations - Determination of water vapour transmission properties of preformed pipe insulation	EN 13469
ISO 18096	<i>Thermal insulating products for building equipment and industrial installations — Determination of maximum service temperature for preformed pipe insulation</i>	EN 14707
ISO 18097	<i>Thermal insulating products for building equipment and industrial installations — Determination of maximum service temperature</i>	EN 14706
ISO 18098	<i>Thermal insulating products for building equipment and industrial installations — Determination of the apparent density of preformed pipe insulation</i>	EN 13470
ISO 18099	<i>Thermal insulating products for building equipment and industrial installations — Determination of the coefficient of thermal expansion</i>	EN 13471

Thermal insulating products for building applications — Determination of the apparent density

1 Scope

This Standard is applicable to full size thermal insulating products and test specimens. This standard can also be applied to the individual layers of multi-layered products. It specifies the equipment and procedures for determining the apparent overall density and the apparent core density under reference conditions.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 29465, *Thermal insulating products for building applications — Determination of length and width*

ISO 29466, *Thermal insulating products for building applications — Determination of thickness*

ISO 29768, *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

apparent overall density, ρ_a

the mass per unit volume of a product, including all surface skins formed during production, but excluding any facings and/or coatings

3.2

apparent core density, ρ_c

the mass per unit volume of the core of a product after all surface skins formed during production and all facings and/or coatings have been removed

4 Principle

The density is determined as the ratio of the mass and the volume of the test specimen.

5 Apparatus

5.1 Balance, capable of determining the mass of a test specimen to an accuracy of 0,5 %.

5.2 Equipment, for the determination of linear dimensions (see 7.2).

ISO/DIS 29470:2019(E)

6 Test specimens

6.1 Dimensions of test specimens

The test specimens shall be full size products or parts of them or; test specimens used for other tests.

The shape of the test specimens shall be such that their volume can be easily calculated.

When the apparent overall density is being determined using test specimens cut from a product with surface skins formed during production, the ratio of the area of the surface skin to the total volume for the test specimen shall be the same as the product.

Where the shape or surface of the product is not rectangular and easy to measure and calculate, a representative piece of the product has to be cut out.

The size of a test specimen should be as large as possible, commensurate with the apparatus available and with the shape of the original product. The size of the test specimens may also be specified in other test methods.

6.2 Number of test specimens

The number of test specimens for full size products shall be as specified in the relevant product standard. If test specimens from other tests are used, the number shall be as specified in the test method. If the number is not specified, then at least five 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 using a method that does not change the original structure of the product.

The location from which the test specimens are taken shall be such that the density obtained is representative of the density of the product.

For determining the apparent overall density, any facings and/or coatings shall be removed from the product.

For determining the apparent core density, any surface skins formed during production and any facings and/or coatings shall be removed from the product.

When it is not possible to remove the facings and/or coatings without influencing the apparent density of the product, the mass of the facings and/or coatings shall be deducted by calculation.

Special methods of preparation, when needed, are given in the relevant product standard.

6.4 Conditioning of test specimens

The specimens shall be conditioned at $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity until constant mass is achieved.

The time for conditioning and the required accuracy of the constant mass measurements shall be given in the relevant product standard.

If it can be shown that temperature and humidity have negligible influence on the determination of the density, then the conditioning may be carried out at $(23 \pm 5) ^\circ\text{C}$.

The conditioning time can be shortened by pre-drying the specimen in a ventilated oven at a prescribed temperature. Appropriate procedures may be given in the relevant product standard.