



**SLOVENSKI STANDARD**  
**SIST EN 1602:2013**

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**Nadomešča:**

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**Toplotnoizolacijski proizvodi za uporabo v gradbeništvu - Ugotavljanje prostorninske mas**

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

Wärmedämmstoffe für das Bauwesen - Bestimmung der Rohdichte

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

**Ta slovenski standard je istoveten z: EN 1602:2013**

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**ICS:**

91.100.60

Materiali za toplotno in zvočno izolacijo

Thermal and sound insulating materials

**SIST EN 1602:2013**

**en,fr,de**



EUROPEAN STANDARD

**EN 1602**

NORME EUROPÉENNE

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English Version

## 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

Wärmedämmstoffe für das Bauwesen - Bestimmung der  
Rohdichte

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

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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## Foreword

This document (EN 1602:2013) 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 1602:1996.

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 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*

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- 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 apparent overall density and the apparent core density under reference conditions. It 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.

## 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 822, *Thermal insulating products for building applications — Determination of length and width*

EN 823, *Thermal insulating products for building applications — Determination of thickness*

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

#### **apparent overall density**

$\rho_a$

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**

$\rho_c$

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).

## 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 test specimens shall be such that their volume can be easily calculated.

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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 shall be the same for the test specimen as for the product.

The size of a test specimen should preferably 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 by methods that do 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.

## 7 Procedure

### 7.1 Test conditions

The test shall be carried out at  $(23 \pm 2) ^\circ\text{C}$  and  $(50 \pm 5) \%$  relative humidity.

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