



# SLOVENSKI STANDARD

## SIST EN 13170:2009

01-februar-2009

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SIST EN 13170:2002

SIST EN 13170:2002/AC:2006

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### Toplotnoizolacijski proizvodi za stavbe - Proizvodi iz ekspandirane plute (ICB) - Specifikacija

Thermal insulation products for buildings - Factory made products of expanded cork (ICB) - Specification

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Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Produkte aus expandiertem Kork (ICB) - Spezifikation

Produits isolants thermiques pour le bâtiment - Produits manufacturés en liège expansé (ICB) - Spécification

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**Ta slovenski standard je istoveten z: EN 13170:2008**

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#### ICS:

91.100.60 Thermal and sound insulating materials

**SIST EN 13170:2009**

**en,de**

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EUROPEAN STANDARD

EN 13170

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2008

ICS 91.100.60

Supersedes EN 13170:2001

English Version

## Thermal insulation products for buildings - Factory made products of expanded cork (ICB) - Specification

Produits isolants thermiques pour le bâtiment - Produits manufacturés en liège expansé (ICB) - Spécification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Produkte aus expandiertem Kork (ICB) - Spezifikation

This European Standard was approved by CEN on 25 October 2008.

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 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 Management Centre has the same status as the official versions.

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## Foreword

This document (EN 13170:2008) 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 May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This document supersedes EN 13170:2001.

This document is one of a series of standards for insulation products used in buildings, but may be used in other areas where appropriate.

In pursuance of Resolution BT 20/1993, revised, CEN/TC 88 have proposed defining the standards listed below as a “package” of documents.

The package of standards comprises the following group of interrelated standards for the specifications of factory made thermal insulation products, all of which come within the scope of CEN/TC 88:

EN 13162, *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

EN 13163, *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*

EN 13164, *Thermal insulation products for buildings — Factory made products of extruded polystyrene foam (XPS) — Specification*

EN 13165, *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification*

EN 13166, *Thermal insulation products for buildings — Factory made products of phenolic foam (PF) — Specification*

EN 13167, *Thermal insulation products for buildings — Factory made cellular glass (CG) products — Specification*

EN 13168, *Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification*

EN 13169, *Thermal insulation products for buildings — Factory made products of expanded perlite (EPB) — Specification*

EN 13170, *Thermal insulation products for buildings — Factory made products of expanded cork (ICB) — Specification*

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EN 13171, *Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This European Standard specifies the requirements for factory made products of expanded cork, which are used for the thermal insulation of buildings. The products are made with granulated cork agglomerated without additional binders and are delivered as boards without facings.

This European Standard specifies product characteristics and includes procedures for testing, evaluation of conformity, marking, labelling and packaging.

Products covered by this European Standard are also used in prefabricated thermal insulation systems and composite panels; the performance of systems incorporating these products is not covered.

This European Standard does not specify the required level of a given property to be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application are to be found in regulations or non-conflicting standards.

Products with a declared thermal resistance lower than  $0,25 \text{ m}^2 \cdot \text{K/W}$ , at  $10 \text{ }^\circ\text{C}$ , or a declared thermal conductivity greater than  $0,060 \text{ W}/(\text{m} \cdot \text{K})$ , at  $10 \text{ }^\circ\text{C}$ , are not covered by this European Standard.

## 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.

EN 822, *Thermal insulating products for building applications — Determination of length and width*  
[https://standards.itih.ai/catalog/standards/sist/7286f389-7f55-4c02-ab47-](https://standards.itih.ai/catalog/standards/sist/7286f389-7f55-4c02-ab47-541dce58db/sist-en-13170-2009)

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 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 1609, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

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EN 12086:1997, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

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 12105, *Resilient floor coverings — Determination of moisture content of agglomerated composition cork*

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 12667, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance*

EN 12939, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Thick products of high and medium thermal resistance*

EN 13172:2008, *Thermal insulating products — Evaluation of conformity<sup>1</sup>*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire test*

EN 13823, *Reaction to fire test for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 29052-1, *Acoustics — Determination of dynamic stiffness — Part 1: Materials used under floating floors in dwellings*

EN 29053, *Acoustics — Materials for acoustical applications - Determination of air flow resistance (ISO 9053:1991)*

EN ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354:2003)*

EN ISO 1182, *Reaction to fire tests for building products — Non-combustibility test (ISO 1182:2002)*

EN ISO 1716, *Reaction to fire tests for building products — Determination of the heat of combustion (ISO 1716:2002)*

EN ISO 9229:2007, *Thermal insulation — Vocabulary (ISO 9229:2007)*

EN ISO 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption (ISO 11654:1997)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame – Part 2: Single-flame source test (ISO 11925-2:2002)*

ISO 12491, *Statistical methods for quality control of building materials and components*

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<sup>1</sup> Under review



### 3 Terms, definitions, symbols, units and abbreviated terms

#### 3.1 Terms and definitions

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

##### 3.1.1 Terms and definitions as given in EN ISO 9229:2007

###### 3.1.1.1

###### **cork**

protective layer of the cork oak tree (*Quercus suber* L.) which may be periodically removed from its trunk and branches to provide the raw material for cork products

###### 3.1.1.2

###### **granulated cork**

fragments of cork obtained by grinding and/or milling raw or manufactured cork

NOTE Usually, the size of granules is between 4 mm and 22 mm.

###### 3.1.1.3

###### **expanded cork board (cork board)**

pre-formed product made from ground granulated cork expanded and bonded exclusively with its own natural binder exuded from cork cell walls by heating under pressure

###### 3.1.1.4

###### **board**

###### **slab**

rigid or semi-rigid (insulation) product of rectangular shape and cross-section in which the thickness is uniform and substantially smaller than the other dimensions

NOTE Boards are usually thinner than slabs. They may also be supplied in tapered form.

##### 3.1.2 Additional terms and definitions

###### 3.1.2.1

###### **level**

given value which is the upper or lower limit of a requirement

NOTE The level is given by the declared value of the characteristic concerned.

###### 3.1.2.2

###### **class**

combination of two levels of the same property between which the performance shall fall

#### 3.2 Symbols, units and abbreviated terms

##### 3.2.1 Symbols and units used in this standard:

$\alpha_p$	is the practical sound absorption coefficient	—
$\alpha_w$	is the weighted sound absorption coefficient	—
$b$	is the width	mm
$c$	is the compressibility	mm
$d$	is the thickness under a load of $(2,5 \pm 0,5)$ kPa	mm

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$d_B$	is the thickness under a load of 2 kPa after removal of an additional load of 48 kPa	mm
$d_L$	is the thickness under a load of 250 Pa	mm
$d_N$	is the nominal thickness of the product	mm
$d_S$	is the thickness of the test specimen	mm
$\Delta\varepsilon_b$	is the relative change in width	%
$\Delta\varepsilon_d$	is the relative change in thickness	%
$\Delta\varepsilon_l$	is the relative change in length	%
$\Delta\varepsilon_s$	is the relative change in flatness	mm/m
$\varepsilon$	is the deformation under specified compressive load and temperature	mm
$\varepsilon_{ct}$	is the compressive creep	%
$\varepsilon_t$	is the total relative thickness reduction	%
$F_p$	is the compressive force at critical point	kN
$H$	is the moisture content	%
$k$	is a factor related to the number of test results available	–
$l$	is the length	mm
$\lambda_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal conductivity	W/(m·K)
$\lambda_D$	is the declared thermal conductivity	W/(m·K)
$\lambda_i$	is one test result of thermal conductivity	W/(m·K)
$\lambda_{\text{mean}}$	is the mean thermal conductivity	W/(m·K)
$n$	is the number of test results	–
$R_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the thermal resistance	m <sup>2</sup> ·K/W
$R_D$	is the declared thermal resistance	m <sup>2</sup> ·K/W
$R_i$	is one test result of thermal resistance	m <sup>2</sup> ·K/W
$R_{\text{mean}}$	is the mean thermal resistance	m <sup>2</sup> ·K/W
$\rho_a$	is the apparent density	kg/m <sup>3</sup>
$S_b$	is the deviation from squareness on length and width	mm/m
$S_d$	is the deviation from squareness on thickness	mm
$S_{\text{max}}$	is the deviation from flatness	mm
$s_R$	is the estimate of the standard deviation of the thermal resistance	m <sup>2</sup> ·K/W
$s_\lambda$	is the estimate of the standard deviation of the thermal conductivity	W/(m·K)
$s'$	is the dynamic stiffness	MN/m <sup>3</sup>
$\sigma_{10}$	is the compressive stress at 10 % deformation	kPa
$\sigma_b$	is the bending strength	kPa
$\sigma_c$	is the declared compressive stress (for compressive creep)	kPa

$\sigma_{mt}$	is the tensile strength perpendicular to faces	kPa
$W_p$	is the short-term water absorption	kg/m <sup>2</sup>
$\tau$	is the shear strength	kPa
$Z$	is the water vapour resistance	m <sup>2</sup> ·h·Pa/mg
AF,i	is the symbol of the declared level of air flow resistivity*	
API	is the symbol of the declared level of practical sound absorption coefficient*	
AWi	is the symbol of the declared level of weighted sound absorption coefficient*	
CC(i <sub>1</sub> /i <sub>2</sub> %,y) $\sigma_c$	is the symbol of the declared level for compressive creep*	
CP	is the symbol of the declared level for compressibility	
CS(1\y)i	is the symbol of the declared level for compressive stress at 10 % deformation*	
DS(TH)	is the symbol of the level for dimensional stability under specified temperature and humidity conditions	
DS(T+)	is the symbol of the declared value for dimensional stability at specified temperature	
DLT	is the symbol of the declared value for the deformation under specified load and temperature	
L	is the symbol of the declared class for length tolerances	
PL(P)	is the symbol of the declared level of point load at the critical point	
SDi	is the symbol of the declared level for dynamic stiffness*	
Ti	is the symbol of the declared class for thickness tolerances*	
TRi	is the symbol of the declared level for tensile strength perpendicular to faces*	
W	is the symbol of the declared class for width tolerances	
WS	is the declared value for short term water absorption	
Zi	is the symbol of the declared value for water vapour resistance*	
i	is the symbol used in the designation code to indicate the relevant class or level of a declared property	
$\sigma_c$	is the symbol used in the designation code to indicate the declared compressive stress for compressive creep	
y	is the symbol used in the designation code to indicate the number of years for extrapolation (compressive creep)	

\* "i" is the relevant class or level, " $\sigma_c$ " is the compressive stress, and "y" is the number of years

### 3.2.2 Abbreviated terms used in this standard:

ICB	Expanded (Insulation) <b>C</b> ork <b>B</b> oard
ITT	Initial Type Test
RTF	<b>R</b> eaction <b>T</b> o <b>F</b> ire
FPC	<b>F</b> actory <b>P</b> roduction <b>C</b> ontrol

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## 4 Requirements

### 4.1 General

Product properties shall be assessed in accordance with Clause 5. To comply with this standard, products shall meet the requirements of 4.2 and of 4.3, as appropriate.

One test result for a product property is the average of the measured values on the number of test specimens given in Table 6.

### 4.2 For all applications

#### 4.2.1 Thermal resistance and thermal conductivity

Thermal resistance and thermal conductivity shall be based upon measurements carried out in accordance with EN 12667 or EN 12939 for thick products.

The thermal resistance and thermal conductivity shall be determined in accordance with procedures given in Annex A and declared by the manufacturer according to the following:

- the reference mean temperature shall be 10 °C;
- the measured values shall be expressed with three significant figures;
- for products of uniform thickness, the thermal resistance,  $R_D$ , shall always be declared. The thermal conductivity,  $\lambda_D$ , shall be declared where possible. Where appropriate, for products of non-uniform thickness (e.g for sloped and tapered products) only the thermal conductivity,  $\lambda_D$ , shall be declared.
- the declared thermal resistance,  $R_D$ , and the thermal conductivity,  $\lambda_D$ , shall be given as limit values representing at least 90 % of the production determined with a confidence level of 90 %;
- the value of the thermal conductivity,  $\lambda_{90/90}$ , shall be rounded upwards to the nearest 0,001 W/(m·K) and declared as  $\lambda_D$  in levels with steps of 0,001 W/(m·K);
- the declared thermal resistance,  $R_D$ , shall be calculated from the nominal thickness,  $d_N$ , and the corresponding thermal conductivity,  $\lambda_{90/90}$ .
- the value of the thermal resistance,  $R_{90/90}$ , when calculated from the nominal thickness,  $d_N$ , and the corresponding thermal conductivity,  $\lambda_{90/90}$ , shall be rounded downwards to the nearest 0,05 m<sup>2</sup>·K/W, and declared as  $R_D$  in levels with steps of 0,05 m<sup>2</sup>·K/W;
- the value of  $R_{90/90}$ , for those products for which only the thermal resistance is measured directly, shall be rounded downwards to the nearest 0,05 m<sup>2</sup>·K/W and declared as  $R_D$  in levels with steps of 0,05 m<sup>2</sup>·K/W.

Examples of determination of declared values of thermal resistance,  $R_D$ , and thermal conductivity,  $\lambda_D$ , are given in Annex C.

#### 4.2.2 Length and width

Length,  $l$ , and width,  $b$ , shall be determined in accordance with EN 822. No test result shall deviate from the nominal values by more than the tolerances given in Table 1 and Table 2 for the declared classes.