

SLOVENSKI STANDARD

SIST EN 13170:2013+A1:2015

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Nadomešča:
SIST EN 13170:2013

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

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

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 13170:2012+A1:2015**

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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**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 6 October 2012 and includes Amendment 1 approved by CEN on 15 December 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 13170:2012+A1:2015 (E)

Foreword

This document (EN 13170:2012+A1:2015) 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of an identical text or by endorsement, at the latest by August 2015, and conflicting national standards shall be withdrawn at the latest by November 2016.

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 A1 EN 13170:2012 A1.

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 EU Directive(s).

A1 For relationship with EU Construction Products Regulation (CPR), see informative Annex ZA, which is an integral part of this standard. A1

This document includes Amendment 1 approved by CEN on 2014-12-15.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

Compared with EN 13170:2008, the main changes are:

- a) better harmonisation between the individual standards of the package (EN 13162 to EN 13171) on definitions, requirements, classes and levels;
- b) new normative annex on multi-layered products;
- c) changes on some editorial and technical content and addition of information on some specific items such as for ICB;
- d) addition of links to EN 15715, *Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing — Factory made products*;
- e) changes to Annex ZA.

A1 Amendment 1 modifies EN 13170:2012 identifying those clauses of the standard which are needed for the compliance of the European Standard with the Construction Products Regulation (CPR).

This amendment introduces

- f) an addition to the foreword;
- g) an addition in 3.2;
- h) a new subclause 4.3.13;
- i) modification of Clause 7;
- j) modification of Clause 8;
- k) modification of Annex B;

l) a new Annex ZA. 

This standard 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 expanded polystyrene (EPS) products — Specification*

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

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

EN 13166, *Thermal insulation products for buildings — Factory made phenolic foam (PF) products — 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 expanded perlite board (EPB) products — Specification*

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

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

The reductions in energy used and emissions produced during the installed life of insulation products exceeds by far the energy used and emissions made during the production and disposal processes.

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, 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.

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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 with or without facings or coatings.

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

This standard describes product characteristics and includes procedures for testing, evaluation of conformity, marking and labelling.

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

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 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*

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*

EN 12086, *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 insulation 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 13172:2012, *Thermal insulation products — Evaluation of conformity*
- EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire test*
- EN 13820, *Thermal insulating materials for building applications — Determination of organic content*
- EN 13823, *Reaction to fire test for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*
- EN 15715:2009, *Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing - Factory made products*
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- EN 29052-1, *Acoustics — Determination of dynamic stiffness — Part 1: Materials used under floating floors in dwellings (ISO 9052-1)*
- EN 29053, *Acoustics — Materials for acoustical applications — Determination of air flow resistance (ISO 9053)*
- EN ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354)*
- EN ISO 1182, *Reaction to fire tests for building products — Non-combustibility test (ISO 1182)*
- EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*
- EN ISO 9229:2007, *Thermal insulation — Vocabulary (ISO 9229:2007)*
- EN ISO 10456, *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values (ISO 10456)*
- EN ISO 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption (ISO 11654)*
- 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)*
- ISO 16269-6:2005, *Statistical interpretation of data — Part 6: Determination of statistical tolerance intervals*

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3 Terms, definitions, symbols, units and abbreviated terms**3.1 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN ISO 9229:2007 apply with exception or in addition of the following:

3.1.1**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

3.1.2**granulated cork**

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

Note 1 to entry: Usually, the size of granules is between 4 mm and 18 mm.

3.1.3**insulation cork board (ICB)**

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

3.1.4**level**

value which is the upper or lower limit of a requirement and given by the declared value of the characteristic concerned

3.1.5**class**

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

3.1.6**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 1 to entry: Boards are usually thinner than slabs. They may also be supplied in tapered form.

3.1.7**facing**

functional or decorative surface layer with a thickness of less than 3 mm, e.g. paper, plastic film, fabric or metal foil, which are not considered as separate thermal insulation layers to be added to the thermal resistance of the product

3.1.8**coating**

functional or decorative surface layers with a thickness of less than 3 mm usually applied by painting, spraying, pouring or trowelling, which are not considered as separate thermal insulation layers to be added to the thermal resistance of the product

3.1.9**composite insulation product**

product which can be faced or coated made from two or more layers bonded together by chemical or physical adhesion consisting of at least one factory made thermal insulation material layer

3.1.10**multi-layered insulation product**

product which can be faced or coated made from two or more layers of a thermal insulation material from the same European Standard, which are bonded together by chemical or physical adhesion either horizontally and/or vertically

3.2 Symbols, units and abbreviated terms

For the purposes of this document, the following symbols and units apply.

α_p	is the practical sound absorption coefficient	—
α_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 (250 ± 5) Pa	mm
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
$\Delta\epsilon_b$	is the relative change in width	%
$\Delta\epsilon_d$	is the relative change in thickness	%
$\Delta\epsilon_l$	is the relative change in length	%
$\Delta\epsilon_s$	is the relative change in flatness	mm/m
ϵ	is the deformation under specified compressive load and temperature	mm
ϵ_{ct}	is the compressive creep	%
ϵ_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)
λ_D	is the declared thermal conductivity	W/(m·K)
λ_i	is one test result of thermal conductivity	W/(m·K)
λ_{mean}	is the mean thermal conductivity	W/(m·K)
λ_U	is the design 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 ² ·K/W
R_D	is the declared thermal resistance	m ² ·K/W





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R_i	is one test result of thermal resistance	$m^2 \cdot K/W$
R_{mean}	is the mean thermal resistance	$m^2 \cdot K/W$
R_U	is the design thermal resistance	$m^2 \cdot K/W$
ρ_a	is the apparent density	kg/m^3
S_b	is the deviation from squareness on length and width	mm/m
S_d	is the deviation from squareness on thickness	mm
S_{max}	is the deviation from flatness	mm
X_0	is the initial deformation	$\%$
X_t	is the total thickness reduction	$\%$
X_{ct}	is the compressive creep	$\%$
s_R	is the estimate of the standard deviation of the thermal resistance	$m^2 \cdot K/W$
s_λ	is the estimate of the standard deviation of the thermal conductivity	$W/(m \cdot K)$
s'	is the dynamic stiffness	MN/m^3
σ_{10}	is the compressive stress at 10 % deformation	kPa
σ_b	is the bending strength	kPa
σ_c	is the declared compressive stress (for compressive creep)	kPa
σ_{mt}	is the tensile strength perpendicular to faces	kPa
W_p	is the short-term water absorption	kg/m^2
τ	is the shear strength	kPa
Z	is the water vapour resistance	$m^2 \cdot h \cdot Pa/mg$

AF_r	is the symbol of the declared level of air flow resistivity
AP	is the symbol of the declared level of practical sound absorption coefficient
AW	is the symbol of the declared level of weighted sound absorption coefficient
$CC(i_1/i_2/y) \sigma_c$	is the symbol of the declared level for compressive creep
CP	is the symbol of the declared level for compressibility
CS(10)	is the symbol of the declared level for compressive stress at 10 % deformation
DS(23,90) or DS(70,90)	is the symbol of the level for dimensional stability under specified temperature and humidity conditions
DS(70,-)	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
MU	is the symbol of the declared value for water vapour diffusion resistance factor

PL(P)	is the symbol of the declared level of point load at the critical point
SD	is the symbol of the declared level for dynamic stiffness
SS	is the symbol of the declared value for shear strength
Ti	is the symbol of the declared class for thickness tolerances
TR	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
Z	is the symbol of the declared value for water vapour resistance

Abbreviated terms used in this standard:

ICB	is Expanded (Insulation) Cork Board
 PTD	is P roduct T ype D etermination (previously named ITT for Initial Type Test) 
FPC	is F actory P roduction C ontrol
RtF	is R eaction to F ire
 AVCP	is A ssessment and V erification of C onstancy of P erformance (previously named attestation of conformity)
DoP	is D eclaration of P erformance
ThI	is T hermal I nsulation for B uildings
VCP	is V erification of C onstancy of P erformance (previously named evaluation of conformity) 

4 Requirements

4.1 General <https://standards.iteh.ai/catalog/standards/sist/64e0ff88-5d43-402b-93bd-205667f721c8/sist-en-13170-2013a1-2015>

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.

For multi-layered products additional requirements are given in Annex C.

One test result for a product property is the average of the measured values on the number of test specimens given in Table 9.

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 and in accordance with 5.3.2 and Annex C.

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 declared values are to be given for a moisture content equal to that of the material when it has reached equilibrium with the air at 23 °C and relative humidity 50 %;
- the measured values shall be expressed with three significant figures;

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- for products of uniform thickness, the thermal resistance, R_D , shall always be declared. The thermal conductivity, λ_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, λ_D , shall be declared;
- the declared thermal resistance, R_D , and the declared thermal conductivity, λ_D , shall be given as limit values representing at least 90 % of the production, determined with a confidence level of 90 %;
- the statistical value of thermal conductivity, $\lambda_{90/90}$, shall be rounded upwards to the nearest 0,001 W/(m·K) and declared as λ_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 , or d_L in case of products with declared compressibility (see 4.3.10.3) and the corresponding thermal conductivity, $\lambda_{90/90}$, unless measured directly;
- the statistical value of thermal resistance, $R_{90/90}$, when calculated from the nominal thickness, d_N , or d_L in case of products with declared compressibility (see 4.3.10.3) and the corresponding thermal conductivity, $\lambda_{90/90}$, shall be rounded downwards to the nearest 0,05 m²·K/W, and declared as R_D in levels with steps of 0,05 m²·K/W;
- the statistical value of thermal resistance $R_{90/90}$, for those products for which only the thermal resistance is measured directly, shall be rounded downwards to the nearest 0,05 m²·K/W and declared as R_D in levels with steps of 0,05 m²·K/W.

Examples of determination of declared values of thermal resistance, R_D , and thermal conductivity, λ_D , are given in Annex D.

NOTE λ_U and R_U (design values) may be determined with reference to EN ISO 10456.

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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.

Table 1 — Classes for length tolerances

Class	Tolerances mm
L1	± 3
L2	± 5

Table 2 — Classes for width tolerances

Class	Tolerances mm
W1	± 2
W2	± 3

NOTE The commonly linear dimensions of Insulation Cork Board are:

Length: 1 000 mm

Width: 500 mm

4.2.3 Thickness

Thickness, d , shall be determined in accordance with EN 823, method B.2, under a pressure of (250 ± 5) Pa. No test result shall deviate from the nominal thickness, d_N , by more than the tolerances given in Table 3 for the declared class.

Table 3 — Classes for thickness tolerances

Class	Thickness	Tolerances
T1	$20 \text{ mm} \leq d \leq 50 \text{ mm}$	$\pm 1 \text{ mm}$
T2	$d > 50 \text{ mm}$	$\pm 2 \%$, maximum $\pm 2 \text{ mm}$

4.2.4 Squareness

Squareness shall be determined in accordance with EN 824. The deviation from squareness on length and width, S_b , shall not exceed 4 mm/m. The deviation from squareness on thickness, S_d , shall not exceed 2 mm.

4.2.5 Flatness

Flatness shall be measured according to EN 825. The deviation from flatness, S_{\max} , of boards and slabs, shall not exceed 2 mm.

4.2.6 Reaction to fire of the product as placed on the market

Reaction to fire classification of the product as placed on the market, shall be determined in accordance with EN 13501-1 and the mounting and fixing rules given in EN 15715.

NOTE This classification is compulsory and always included in the CE Marking label.
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Detailed information about the test conditions and the field of application of the classification as stated in the reaction to fire classification report shall be given in the manufacturer's literature.

4.2.7 Durability characteristics

4.2.7.1 General

The appropriate durability characteristics have been considered and are covered in 4.2.7.2, 4.2.7.3. and where appropriate in 4.3.6 on compressive creep.

4.2.7.2 Durability of reaction to fire of the product as placed on the market against ageing/degradation

The reaction to fire performance of ICB products as declared by 4.2.6 does not change with time.

4.2.7.3 Durability of thermal resistance and thermal conductivity against ageing/degradation

The thermal conductivity of insulation cork board products does not change with time. This is covered and considered for declaration by 4.2.1 thermal conductivity and any change in thickness is covered by at least one of the 4.3.2 dimensional stability tests, as relevant.

4.2.8 Moisture content

Moisture content, H , shall be determined in accordance with EN 12105. The product shall be protected from rain during storage. Under these conditions, no test result shall exceed a mass fraction of 8 %.