

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

ICS 79.100; 91.100.60

National foreword

This British Standard is the UK implementation of EN 13170:2008. It supersedes BS EN 13170:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/540, Energy performance of materials components and buildings.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2009

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ISBN 978 0 580 59859 3

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13170

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.

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Ref. No. EN 13170:2008: E

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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of an identical text or by endorsement, at the latest by May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

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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*

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.

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 $0,25 \text{ m}^2\cdot\text{K}/\text{W}$, at 10°C , or a declared thermal conductivity greater than $0,060 \text{ W}/(\text{m}\cdot\text{K})$, at 10°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*

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 ($23^\circ\text{C}/50\%$ 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*

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*¹

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*

¹ 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:

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 $(2,5 \pm 0,5)$ kPa	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
$\Delta \varepsilon_b$	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
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)
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
R_i	is one test result of thermal resistance	m ² ·K/W
R_{mean}	is the mean thermal resistance	m ² ·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
s_R	is the estimate of the standard deviation of the thermal resistance	m ² ·K/W
s_λ	is the estimate of the standard deviation of the thermal conductivity	W/(m·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 ·h·Pa/mg

AF _i	is the symbol of the declared level of air flow resistivity*
AP _i	is the symbol of the declared level of practical sound absorption coefficient*
AW _i	is the symbol of the declared level of weighted sound absorption coefficient*
CC(i_1/i_2 %,y) σ_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
SD _i	is the symbol of the declared level for dynamic stiffness*
T _i	is the symbol of the declared class for thickness tolerances*
TR _i	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 _i	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
σ_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, " σ_c " is the compressive stress, and "y" is the number of years

3.2.2 Abbreviated terms used in this standard:

ICB	Expanded (Insulation) C ork B oard
ITT	Initial T ype T est
RTF	R ea T ion T o F ire
FPC	F actory P roduction C ontrol

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, 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 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 value of the 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 , 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 m²·K/W, and declared as R_D in levels with steps of 0,05 m²·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 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 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.