SLOVENSKI STANDARD
SIST EN 16069:2013

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Toplotnoizolacijski proizvodi za stavbe - Proizvodi iz polietilenske pene (PEF) - Specifikacija

Thermal insulation products for buildings - Factory made products of polyethylene foam (PEF) - Specification

Wärmedämmstoffe für Gebäude - Werkmäßig hergestellte Produkte aus Polyethylenschaum (PE) - Spezifikation

Produits isolants thermiques pour le bâtiment - Produits manufacturés en mousse de polyéthylène (PE) - Spécification

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ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials

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English Version

Thermal insulation products for buildings - Factory made products of polyethylene foam (PEF) - Specification

Produits isolants thermiques pour le bâtiment - Produits manufacturés en mousse de polyethylene (PE) - Spécification

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Foreword

This document (EN 16069:2012) 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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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 EU Directive(s).

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

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

The reduction 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 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 requirements for factory made polyethylene foam (PEF) products, with or without facing or coating, which are used for thermal insulation of buildings. The products are manufactured in the form of boards or rolls or other preformed ware.

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

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

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 0,5 m^2K/W or a declared thermal conductivity greater than 0,050 W/(m·K) at 10 °C are not covered by this European Standard.

This standard does not cover in situ insulation products and products intended to be used for the insulation of building equipment and industrial installations (covered by EN 14313). Further excluded are non-foamed materials such as bubble films, foils etc.

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 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 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 12087, *Thermal insulating products for building applications — Determination of long term water absorption by immersion*

EN 12430, *Thermal insulating products for building applications — Determination of the 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 tests*

EN 13823, *Reaction to fire tests 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*

EN 29052-1, *Acoustics — Determination of dynamic stiffness — Part 1: Materials used under floating floors in dwellings (ISO 9052-1)*

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 1798, *Flexible cellular polymeric materials — Determination of tensile strength and elongation at break (ISO 1798:2008)*

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)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of 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*

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 and the following apply.

3.1.1
polyethylene foam
semi-rigid or flexible cellular plastics insulation material based on polymers derived mainly from ethylene and/or propylene

3.1.2
level
given value which is the upper or lower limit of a requirement and given by the declared value of the characteristic concerned

3.1.3
class
combination of two levels of the same property between which the performance shall fall

3.1.4
roll
(insulation) product supplied in the form of a spirally wound cylinder

3.1.5
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 A board is usually thinner than a slab. They may also be supplied in tapered form.

3.1.6
facing
functional or decorative surface layer with a thickness of less than 3 mm, e.g. paper, plastic film, fabric or metal foil, which is not considered as separate thermal insulation layer to be added to the thermal resistance of the product

3.1.7
coating
functional or decorative surface layer with a thickness of less than 3 mm usually applied by painting, spraying, pouring or trowelling, which is not considered as separate thermal insulation layer to be added to the thermal resistance of the product

3.1.8
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

3.1.9
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 horizontally by chemical or physical adhesion

3.2 Symbols, units and abbreviated terms

3.2.1 Symbols and units used in this European Standard

αp	is the practical airborne sound absorption coefficient	-
α_w	is the weighted airborne sound absorption coefficient	-
b	is the width	mm
c	is the compressibility	mm
d	is the thickness	mm
d_B	is the thickness under load of 2 kPa after removal of an additional load of 48 kPa	mm
d_L	is the thickness under load of 250 Pa	mm
d_N	is the nominal thickness of a product	m
$\Delta\varepsilon_b$	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 flatness	mm/m
F_p	is the point load at a given deformation	N
k	is a factor related to the number of test results	-
l	is the length	mm
λ	is the thermal conductivity	W/(m·K)
$\lambda_{90/90}$	is a 90 % fractile with a confidence level of 90 % for the thermal conductivity	W/(m·K)
λ_D	is the declared of thermal conductivity	W/(m·K)
λ_i	is one test result of thermal conductivity	W/(m·K)
λ_U	is the design thermal conductivity	W/(m·K)
λ_{mean}	is the mean value of the measured thermal conductivity	W/(m·K)
μ	is the water vapour diffusion resistance factor	-
n	is the number of test results	-
ρ_a	is the apparent density	kg/m^3
$R_{90/90}$	is a 90 % fractile with the 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 value of the measured thermal resistance	m^2·K/W
R_U	is the design thermal resistance	m^2·K/W
S_b	is the deviation from squareness of the edge on length and width	mm/m
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
$\sigma_{\%}$	is the compressive stress at defined % of deformation	kPa
σ_b	is the bending strength	kPa
σ_c	is the compressive stress	kPa
σ_{mt}	is the tensile strength perpendicular to faces	kPa
TE_L	is the tensile elongation in length	%
TE_w	is the tensile elongation in width	%
TS_l	is the tensile strength in length	kPa
TS_w	is the tensile strength in width	kPa
τ	is the shear strength	kPa
W_{lp}	is the long term water absorption by partial immersion	kg/m^2
W_{lt}	is the long term water absorption by total immersion	vol.-%
Wp	is the short term water absorption by partial immersion	kg/m^2
X_{ct}	is the compressive creep	mm or %
Z	is the water vapour resistance	m^2·h·Pa/mg

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

BS is the symbol of the declared level for bending strength

CC(i1/i2/y)σc is the symbol of the declared level for compressive creep

CP is the symbol of the declared level for compressibility

CS(10\Y) is the symbol of the declared level for compressive stress at defined % of deformation

DS(N) is the symbol of the declared level for dimensional stability under normal laboratory conditions

DS(23,90) is the symbol of the declared value for dimensional stability under specified temperature and relative humidity conditions

DS (70,-) is the symbol of the declared value for dimensional stability under specified temperature and relative humidity conditions

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

P is the symbol of the declared class for flatness tolerance

PL is the symbol of the declared level of point load at defined deformation

S is the symbol of the declared class for squareness tolerance

SD is the declared level for dynamic stiffness

T is the symbol of the declared class for thickness tolerance

W is the symbol of the declared class for width tolerance

WL(P) is the symbol of the declared level for water absorption by partial immersion

WL(T) is the symbol of the declared level for water absorption by total immersion

Z is the symbol of the declared value for water vapour resistance

3.2.2 Abbreviated terms used in this European Standard:

PEF is **P**oly**E**thylene **F**oam

ITT is **I**nital **T**ype **T**est

FPC is **F**actory **P**roduction **C**ontrol

RtF is **R**eaction **t**o **F**ire

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 the requirements 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 6.

NOTE Information on additional properties is given in Annex E.

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 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 declared 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 (i.e. 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 m^2·K/W, and declared as R_D in levels with steps of 0,05 m^2·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 m^2·K/W and declared as R_D in levels with steps of 0,05 m^2·K/W.

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