



SLOVENSKI STANDARD
SIST EN 16069:2013

01-marec-2013

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

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

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

This European Standard was approved by CEN on 6 October 2012.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

Foreword.....	5
1 Scope	6
2 Normative references	6
3 Terms, definitions, symbols, units and abbreviated terms	7
3.1 Terms and definitions	7
3.2 Symbols, units and abbreviated terms.....	8
3.2.1 Symbols and units used in this European Standard	8
3.2.2 Abbreviated terms used in this European Standard:.....	10
4 Requirements	11
4.1 General.....	11
4.2 For all applications	11
4.2.1 Thermal resistance and thermal conductivity	11
4.2.2 Length and width	12
4.2.3 Thickness	12
4.2.4 Squareness.....	12
4.2.5 Flatness	13
4.2.6 Reaction to fire of the product as placed on the market	13
4.2.7 Durability characteristics.....	13
4.3 For specific applications.....	13
4.3.1 General.....	13
4.3.2 Dimensional stability.....	13
4.3.3 Compressive stress or compressive strength	14
4.3.4 Tensile strength and elongation in length and width.....	14
4.3.5 Point load.....	15
4.3.6 Compressive creep.....	15
4.3.7 Water absorption	15
4.3.8 Water vapour transmission	15
4.3.9 Dynamic stiffness	16
4.3.10 Compressibility	16
4.3.11 Sound absorption	17
4.3.12 Width length and thickness of preformed products	17
4.3.13 Release of dangerous substances.....	18
4.3.14 Reaction to fire of the product in standardized assemblies simulating end-use applications	18
4.3.15 Continuous glowing combustion.....	18
5 Test methods.....	19
5.1 Sampling.....	19
5.2 Conditioning.....	19
5.3 Testing	19
5.3.1 General.....	19
5.3.2 Thermal resistance and thermal conductivity	19
6 Designation Code	21
7 Evaluation of conformity.....	22
7.1 General.....	22
7.2 Initial type testing	22
7.3 Factory production control.....	23
8 Marking and labelling	23
Annex A (normative) Determination of the declared values of thermal resistance and thermal conductivity.....	24

A.1	General	24
A.2	Input data.....	24
A.3	Declared values	24
A.3.1	General	24
A.3.2	Case where thermal resistance and thermal conductivity are declared	24
	Case where only thermal resistance is declared	25
Annex B (normative)	Initial type testing (ITT) and factory production control (FPC)	26
Annex C (normative)	PEF multilayered insulation products	30
C.1	General	30
C.2	Requirements.....	30
C.2.1	For all applications	30
C.2.2	For specific applications	31
C.3	Test methods	31
C.4	Evaluation of conformity	31
Annex D (informative)	Examples for the determination of the declared values of thermal resistance and thermal conductivity for a product or a product group	32
D.1	Case where both thermal resistance and thermal conductivity are declared.....	32
D.2	Case where only thermal resistance is declared	33
Annex E (informative)	Additional properties	35
E.1	General	35
E.2	Deformation under specific compressive load and temperature conditions.....	35
E.3	Compression modulus of elasticity.....	35
E.4	Bending strength.....	35
E.5	Apparent density.....	35
E.6	Compressive stress at defined deformation	36
E.7	Air flow resistivity.....	36
E.8	Cyclic load behaviour	36
E.9	Shear behaviour	36
E.10	Peel strength.....	36
Annex ZA (informative)	Clauses of this European Standard addressing the provisions of the EU Construction Products Directive	38
ZA.1	Scope and relevant characteristics	38
ZA.2	Procedures for attestation of conformity of factory made PolyEthylene Foam products.....	40
ZA.2.1	Systems of attestation of conformity	40
ZA.2.2	EC certificate and declaration of conformity.....	42
ZA.3	CE Marking and labelling.....	44
	Bibliography	46

Tables

Table 1	— Level and classes for dimensional tolerances	12
Table 2	— Dimensional stability under specified temperature and humidity conditions	14
Table 3	— Classes for thickness tolerances	16
Table 4	— Levels for compressibility.....	17
Table 5	— Levels for dimensions of preformed products.....	18
Table 6	— Test methods, test specimens and conditions.....	20
Table A.1	— Values for k for one sided 90 % tolerance interval with a confidence level of 90 %	25

EN 16069:2012 (E)

Table B.1 — Minimum number of tests for ITT and minimum product testing frequencies	26
Table B.2 — Minimum product testing frequencies for the reaction to fire characteristics	29
Table D.1 — λ test results	32
Table D.2 — R test results	33
Table E.1 — Levels of bending strength.....	35
Table E.2 — Levels for compressive stress at a defined deformation	36
Table E.3 — Test methods, test specimens, conditions and minimum testing frequencies	37
Table ZA.1 — Relevant clauses for PolyEthylene Foam and intended use.....	39
Table ZA.2 — Systems of attestation of conformity	40
Table ZA.3.1 — Assignment of evaluation of conformity tasks for products under system 1 for reaction to fire and system 3 for other characteristics.....	41
Table ZA.3.2 — Assignment of evaluation of conformity tasks for products under system 3 or system 3 combined with system 4 for reaction to fire	42

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Figures

Figure ZA.1 — Example CE marking information.....	45
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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.

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 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.

EN 16069:2012 (E)**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 m²K/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*
<https://standards.iteh.ai/catalog/standards/sist/49f0584a-09a1-4a70-b969-180a81d7441c/en-16069-2013>

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

EN 16069:2012 (E)**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

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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

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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**

α_p	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.-%
W_p	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

EN 16069:2012 (E)

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(1/12/y) σ_c	is the symbol of the declared level for compressive creep
CP	is the symbol of the declared level for compressibility
CS(10Y)	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 PolyEthylene Foam
ITT	is Initial Type Test
FPC	is Factory Production Control
RtF	is Reaction to Fire

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