



SLOVENSKI STANDARD
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Toplotnoizolacijski proizvodi za stavbe - Proizvodi, izdelani na mestu vgradnje iz nevezanih in vezanih kroglic iz ekspaniranega polistirena (EPS) - 1. del: Specifikacija za nevezane in vezane proizvode pred vgradnjo

Thermal insulation products of buildings - In-situ formed products from loose-fill expanded polystyrene (EPS) beads and bonded expanded polystyrene beads - Part 1: Specification for the bonded and loose-fill products before installation

Wärmedämmstoffe für Gebäude - An der Verwendungsstelle hergestellte Produkte aus losen expandierten Polystyrolkugeln (EPS) und gebundenen expandierten Polystyrolkugeln - Teil 1: Spezifikation für gebundene und lose Schütt- und Einblasdämmstoffe vor dem Einbau

Produits isolants thermiques destinés aux bâtiments - Produits formés sur place à partir de billes en polystyrène expansé (PSE) en vrac et de billes en polystyrène expansé liées - Partie 1 : Spécification des produits avec et sans liant avant mise en œuvre

Ta slovenski standard je istoveten z: prEN 16809-1

ICS:

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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Thermal insulation products of buildings - In-situ formed products from loose-fill expanded polystyrene (EPS) beads and bonded expanded polystyrene beads - Part 1: Specification for the bonded and loose-fill products before installation

Produits isolants thermique pour le bâtiment - Produits formés in-situ à base de perles de polystyrène expansé (EPS) avec et sans liant - Partie 1 : Spécification des produits avec et sans liant avant l'installation

Wärmedämmstoffe für Gebäude - An der Verwendungsstelle hergestellte Wärmedämmung aus Polystyrol-Partikelschaum-Granulat (EPS) - Teil 1: Spezifikation für lose und gebundene, Schütt- und Einblasdämmstoffe vor dem Einbau

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 88.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 16809-1:2018) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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

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

prEN 16809, *Thermal insulation products for buildings — In situ formed products from loose-fill expanded polystyrene (EPS) beads and bonded expanded polystyrene beads*, consists of two parts which form a package. The first part (this European Standard), which is the harmonized part satisfying the mandate, the CPD and is the basis for the CE marking, covers the products, which are placed on the market. The second part, which is the non-harmonized part, covers the specification for the installed products. Both parts need to be used for the application of the insulation product in the end-use applications covered by EN 16809-2.

This European Standard is one of a series for mineral wool, expanded clay, expanded perlite, exfoliated vermiculite, polyurethane/polyisocyanurate, cellulose, bound expanded polystyrene and loose-fill and bonded EPS beads *in situ* formed 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.

[SIST EN 16809-1:2020](https://standards.iteh.ai/catalog/standards/sist/05dfc206-3b8d-468b-acf8-0dce974fa425/sist-en-16809-1-2020)

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1 Scope

This document specifies the requirements for products of loose-filled expanded polystyrene (EPS) beads and bonded expanded polystyrene beads for *in situ* installation in masonry cavity walls and frame constructions.

This document is a specification for the insulation products before installation. It describes the product characteristics and includes procedures for testing, marking and labelling.

This document 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.

NOTE To avoid water penetration in masonry walls special tests adjusted to local climate might be needed.

This document does not cover factory made expanded polystyrene (EPS) insulation products or factory made or *in situ* products intended to be used for the insulation of building equipment and industrial installations.

Products with a declared thermal resistance lower than $0,25 \text{ m}^2 \cdot \text{K}/\text{W}$ 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 document.

This document does not cover products intended for airborne sound insulation and for acoustic absorption applications.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution - Sieving method* standards.iteh.ai/catalog/standards/sist/05dfc206-3b8d-468b-acf8-0dce974fa425/sist-en-16809-1-2020

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

EN 12086:2013, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

EN ISO 10456:2007, *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007)*

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, *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 13820, *Thermal insulating materials for building applications — Determination of organic content*

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, *Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing — Factory made products*

EN ISO 1182, *Reaction to fire tests for 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 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 16269-6:2014, *Statistical interpretation of data — Part 6: determination of statistical tolerance intervals*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

expanded polystyrene beads

insulation material consisting of beads manufactured from expandable polystyrene or one of its copolymers with an air filled closed cellular structure

3.1.2

blowing hole

hole, cut or formed, in a masonry cavity wall or frame construction, through which the EPS beads are blown

3.1.3

class

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

3.1.4

coverage

mass of insulation per unit area

3.1.5

frame construction

walls with wood or metal studs, sloping roof with insulation between rafters, the larger surfaces covered by facings

prEN 16809-1:2018 (E)**3.1.6****level**

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

3.1.7**performance chart**

table giving thickness and coverage requirements for different values of declared thermal resistance

3.1.8**settlement**

decrease of installed insulation height in cavities and frame constructions with time, expressed as a percentage of the initial installed height

3.2 Symbols and abbreviations

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

$\lambda_{90/90}$	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)
$\rho_{90/90}$	is the 90 % fractile with a confidence level of 90 % for the density	kg/m ³
ρ_I	is one test result of density	kg/m ³
ρ_{mean}	is the mean value of density	kg/m ³
ρ_D	is the declared density	kg/m ³
A	is the area of the test specimen	m ²
d	is the thickness of the test specimen	mm
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
s_λ	is the estimate of the standard deviation of the thermal conductivity	W/(m·K)
s_R	is the estimate of the standard deviation of the thermal resistance	W/(m·K)
s_ρ	is the estimate of the standard deviation of the density	kg/m ³
W_p	is the short-term water absorption	kg/m ²
Q_{nom}	is the nominal weight of the quantity delivered	kg
MU	is the symbol for the declared value for water vapour diffusion resistance factor	
S	is the symbol for the declared class for settlement	

WS is the symbol of the declared level for short-term water absorption

For the purposes, the following abbreviations apply.

EPS is **Expanded PolyStyrene**

AVCP is **Assessment and Verification of Constancy of Performance** (previously named Attestation of Conformity)

DoP is **Declaration of Performance**

FPC is **Factory Production Control**

PTD is **Product Type Determination** (previously named ITT for Initial Type Test)

RtF is **Reaction to Fire**

ThIB is **Thermal Insulation for Buildings**

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.

This document gives performance charts for two different applications:

- masonry cavity wall insulation;
- frame insulation.

One test result on a product property is the average of the measured values on the number of test specimens given in Table 1.

4.2 For all applications

4.2.1 Thermal conductivity – Thermal resistance

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 values 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;
- the thermal resistance, R_D , shall always be declared. The thermal conductivity, λ_D , shall be declared where possible;
- the 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 thermal conductivity $\lambda_{90/90}$ shall be rounded upwards to the nearest 0,001 W/(m·K) and declared in levels with steps of 0,001 W/(m·K);
- the declared thermal resistance, R_D , shall be calculated from the insulation thickness and the corresponding thermal conductivity, $\lambda_{90/90}$ (see Note below);

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- the value of thermal resistance, R_D , shall be rounded downward to the nearest $0,05 \text{ m}^2 \cdot \text{K}/\text{W}$ and declared in levels with steps of $0,05 \text{ m}^2 \cdot \text{K}/\text{W}$.

NOTE The declaration of the installed thermal resistance for blown EPS beads is described in prEN 16809-2.

4.2.2 Density of the sale unit

The density of the material in one sale unit shall not be lower than the minimum density declared by the manufacturer.

4.2.3 Expanded bead size

The bead size measured according to EN 933-1.

NOTE The bead size normally is between 1 mm and 10 mm.

In masonry cavity wall insulation and frame insulation the bead size should be suitable for the way the beads are injected into the cavity.

4.2.4 Settlement

For bonded beads no settlement occurs.

For loose beads measuring the settlement shall be performed according to Annex G. The settlement, S , shall be declared in steps of 1 %.

NOTE Test methods to determine the settlements in masonry walls and frame constructions are currently under investigation and therefore when a test method is available this European Standard will be amended.

4.2.5 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 Annex D, EN 13501-11 and the basic Mounting and Fixing rules given in EN 15715.

NOTE This classification is compulsory and always included in the CE Marking label.

Detailed information about the test conditions on tests on bonded or loose-fill products 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.

4.2.6 Durability characteristics**4.2.6.1 General**

The appropriate durability characteristics have been considered and are covered in 4.2.6.2, 4.2.6.3 and 4.2.6.4.

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

The reaction to fire performance of EPS beads as declared by 4.2.5 Reaction to fire of the product as placed on the market does not change with time.

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

The thermal conductivity of products of EPS beads as declared by 4.2.1 Thermal conductivity – thermal resistance does not change with time.

4.2.6.4 Durability of thermal resistance against ageing/degradation

Durability of the thermal resistance is covered by the durability of the installed thickness.