SLOVENSKI STANDARD
oSIST prEN 15600-1:2007

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Toplotnoizolacijski proizvodi za opremo stavb in industrijske inštalacije - Proizvodi iz ekspandiranega vermikulita (EV), oblikovani na mestu vgradnje - 1. del: Specifikacija za vezane in razsute proizvode pred vgradnjo

Thermal insulation products for building equipment and industrial installations - In-situ thermal insulation formed from exfoliated vermiculate (EV) products - Part 1: Specification for bonded and loose-fill products before installation

Wärmedämmstoffe für die Haustechnik und für betriebstechnische Anlagen - An der Verwendungsstelle hergestellte Wärmedämmung mit Produkten aus expandiertem Vermiculite (EV) - Teil 1: Spezifikation für gebundene und Schüttprodukte vor dem Einbau

Produits isolants thermiques pour l'isolation du bâtiment et les installations industrielles - Isolation thermique formée en place a base de granulats légers de Vermiculite exfoliée (EV) - Partie 1: Spécification de produits liés et en vrac avant mise en oeuvre

Ta slovenski standard je istoveten z: **prEN 15600-1**

ICS:

91.100.60	Materiali za toplotno in zvoļ no izolacijo	Thermal and sound insulating materials

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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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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 15600-1:2006) 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 essential requirements of EU Directive.

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

This standard consists of two parts. The first part, which is the harmonised 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-harmonised part, covers the specification for the installed products.

This document contains five annexes:

Annex A (infornormative) - Factory production control

Annex B (normative) - Preparation of test specimens to measure thermal conductivity

Annex C (normative) - Special conditions to be used for the determination of organic content

Annex D (normative) - Determination of maximum service temperature

Annex ZA (informative) - Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

This European Standard is one of a series for urea formaldehyde foam, loose-fill cellulose products, expanded perlite and exfoliated vermiculite in-situ formed insulation products used in building equipment and industrial installations, but this standard may be used in other areas where appropriate. EN 14317-1 covers the use of exfoliated vermiculite in buildings.

1 Scope

This European Standard specifies the requirements for exfoliated vermiculite products which are used for the thermal insulation of building equipment and industrial installations with an operating temperature in the range of approximately 0 ºC to +1050 ºC.

NOTE Exfoliated vermiculite products can be used below 0 °C. The manufacturer's advice should be obtained regarding the suitability of the product in the intended application below 0°C.

This European Standard specifies the requirements for the three types of exfoliated vermiculite products Vermiculite Aggregate (EVA), Coated Vermiculite (EVC) and Premixed Vermiculite (EVM), containing less than 1 % organic material as defined by annex C.

This Part 1 of this standard is a specification for the insulation products before installation.

This Part 1 of this standard describes the product characteristics and includes procedures for testing, evaluation of conformity, marking and labelling.

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.

This European Standard does not cover factory made insulation products of formed shapes and boards made with exfoliated vermiculite, and does not cover products intended to be used for the insulation of buildings.

This European Standard does not specify performance requirements for airborne sound insulation and for acoustic absorption applications.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references subsequent amendments to or revisions of any of the publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 932-1, *Tests for general properties of aggregates — Part 1: Methods for sampling.*

EN 932-2, *Tests for general properties of aggregates — Part 2: Methods for reducing laboratory samples.*

EN 933-1, *Tests for geometrical properties of aggregates — Part 1: Determination of particle size distribution — Sieving method.*

EN 993-14, *Methods of test for dense shaped refractory products. Determination of thermal conductivity by the hot-wire (cross-array) method.*

EN 1097-3, *Tests for mechanical and physical properties of aggregates — Part 3: Determination of loose bulk density and voids.*

EN 12667, *Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance.*

EN 13055-1, *Lightweight aggregates for concrete, mortar and grout.*

EN 13055-2, *Lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications excluding concrete, mortar and grout.*

EN 13172, *Thermal insulating products — Evaluation of conformity.*

EN 13468, *Thermal insulating products for building equipment and industrial installations. Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH.*

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

prEN 14706, *Thermal insulating products for building equipment and industrial installations. Determination of maximum service temperature.*

prEN ISO 9229, *Thermal insulation — Definitions of terms.*

EN ISO 13787, *Thermal insulation products for building equipment and industrial installations - Determination of declared thermal conductivity.*

3 Terms, definitions, symbols, units and abbreviated terms

3.1 Terms and definitions

For the purpose of this standard, the following terms and definitions apply.

3.1.1 Terms and definitions as given in prEN ISO 9229

3.1.1.1
exfoliated vermiculite
insulation material which results from expanding or exfoliating a natural micaceous mineral by heating

3.1.2 Additional terms and definitions

3.1.2.1
vermiculite aggregate
exfoliated vermiculite with no treatment or surface coating, used as a loose insulation in cavities

3.1.2.2
coated vermiculite
exfoliated vermiculite which has a coating

3.1.2.3
premixed vermiculite
exfoliated vermiculite premixed with binders

3.1.2.4
level
the given value which is the upper or lower limit of requirement, where the level is given by the declared value of the characteristic concerned

3.1.2.5
class
a combination of two levels of the same property between which the performance shall fall, where the level is given by the declared value of the characteristic concerned

3.2 Symbols, units and abbreviated terms

Symbols and units used in this standard:

λ_D	is the declared thermal conductivity	W/(m·K)
μ	is the water vapour diffusion resistance factor	

CR is the symbol of the declared value for crushing resistance

LD is the symbol of the declared value for loose bulk density

PS is the symbol of the declared particle size

ST(+) is the symbol of the declared maximum service temperature

ST(-) is the symbol of the declared minimum service temperature

Abbreviated terms used in this standard:

EVA is vermiculite aggregate as defined in 3.1.2.1

EVC is coated vermiculite as defined in 3.1.2.2

EVM is premixed vermiculite as defined in 3.1.2.3

ITT is initial type testing.

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.

One test result for 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 conductivity shall be based upon measurements carried out in accordance with EN 12667 or EN 993-14.

The thermal conductivity values shall be declared by the manufacturer in accordance with EN ISO 13787 at reference mean temperatures covering the product service temperature range. The following conditions apply:

— the measured values shall be expressed with three significant figures;

— the declared thermal conductivity curve shall be given as a limit curve, defined in EN ISO 13787;

— the values of the thermal conductivity, λ_D, shall be rounded upwards to the nearest 0,001 W/(m · K).

4.2.2 Loose bulk density

Loose bulk density shall be determined in accordance with EN 1097-3. However the container should be filled using a flat bottomed scoop held centrally over the container without touching it, and be no more than 50 mm above the rim. The value shall be expressed as kg/m^3 and declared by the manufacturer in steps of 1 kg/m^3.

The loose bulk density shall be in the range of ± 15 % of the manufacturer's declared value.

NOTE Most exfoliated vermiculite products are in the range 50 kg/m^3 to 180 kg/m^3.

4.2.3 Particle size

4.2.3.1 Particle size distribution

Particle size distribution shall be determined in accordance with EN 933-1 without washing and expressed as a percentage by mass, and shall be in accordance with the manufacturer's declared limits.

4.2.3.2 Size designation

The particle size shall be designated by two sieve sizes between which the main proportion of the material lies and any undersize or oversize shall comply with 4.2.3.2 and 4.2.3.3.

The size in mm shall be selected from those specified in EN 13055-2.

NOTE The particle size will normally be in the range 0 to 32 mm.

4.2.3.3 Undersize

The content of the undersize shall not exceed 15 % by mass.

4.2.3.4 Oversize

The content of oversize shall not exceed 10 % by mass.

4.2.4 Reaction to fire

This property is not measured since exfoliated vermiculite products described by this standard are classified without testing as class A1 products.

NOTE 1 The products are classified without testing as class A1 products in accordance with commission decision 96/603/EC as amended by decision 2000/605/EC.

NOTE 2 Products with an organic content greater than 1 % are outside the scope of this standard.

4.2.5 Durability characteristics

4.2.5.1 General

The appropriate durability characteristics have been considered and are covered in 4.2.5.2, 4.2.5.3 and 4.2.5.4.

4.2.5.2 Durability of reaction to fire against ageing/degradation

The fire performance of exfoliated vermiculite does not change with time (see 4.2.4).

4.2.5.3 Durability of thermal resistance against ageing/degradation

The thermal conductivity (4.2.1) of the product does not change with time.

4.2.5.4 Durability of compression strength against ageing/degradation

The compressive strength of exfoliated vermiculite does not change with time. Exfoliated vermiculite is a stable laminar structure.

4.2.5.5 Durability of thermal resistance against high temperature

The thermal conductivity of exfoliated vermiculite products does not change with time at any specific temperature within the service temperature range. This is covered by 4.3.2 maximum service temperature (dimensional stability).

4.3 For specific applications

4.3.1 General

If there is no requirement for a property described in 4.3 for a product in use, then the property does not need to be determined and declared by the manufacturer.

4.3.2 Maximum service temperature

The maximum service temperature, ST(+), shall be determined in accordance with annex D for loose-fill products or prEN 14706 for bonded products.

The maximum service temperature, ST(+), shall be declared in °C in levels with steps of 50 °C.

4.3.3 Minimum service temperature

The minimum service temperature, ST(-), is not determined. Exfoliated vermiculite is stable below 0 °C.

4.3.4 Crushing resistance

In load bearing applications the crushing resistance shall be determined in accordance with EN 13055-1 and expressed in N/mm^2.

NOTE Crushing resistance is a measure of the strength of the material but it does not necessarily relate directly to load bearing capacity.

4.3.5 Water vapour transmission

This property is not measured because the open structure of the final product itself offers no resistance to the free movement of water vapour.

NOTE μ, for exfoliated vermiculite may be assumed to be 3.

4.3.6 Trace quantities of water soluble ions and pH-value

Vermiculite is inert and trace quantities of water soluble ions and pH-value are not determined.

4.3.7 Release of dangerous substances

See annex ZA.