BS EN 15599-1:2010

BSI Standards Publication

Thermal insulation products for building equipment and industrial installations — In-situ thermal insulation formed from expanded perlite (EP) products

Part 1: Specification for bonded and loose-fill products before installation

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National foreword

This British Standard is the UK implementation of EN 15599-1:2010.

The UK participation in its preparation was entrusted to Technical Committee PRI/72, Rigid cellular materials.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

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

Produits isolants thermiques pour l'équipement du bâtiment et les installations industrielles - Isolation thermique formée en place à base de granulats légers de Perlite expansée (EP) - Partie 1: Spécification de produits liés et en vrac avant mise en oeuvre

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische Anlagen in der Industrie - An der Verwendungsstelle hergestellte Wärmedämmung mit Produkten aus expandiertem Perlit (EP) - Teil 1: Spezifikation für gebundene und Schüttprodukte vor dem Einbau

This European Standard was approved by CEN on 6 May 2010.

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Foreword

This document (EN 15599-1:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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 European Standard consists of two parts which form a package. 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 (normative) - 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 polyurethane/polyisocyanurate, 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 14316-1 covers the use of expanded perlite in buildings.

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 organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, 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.

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1 Scope

This European Standard specifies the requirements for expanded perlite products which are used for the thermal insulation of building equipment and industrial installations with an operating temperature in the range of approximately –270 ºC to +650 ºC.

This European Standard specifies the requirements for the four types of expanded perlite products Perlite Aggregate (EPA), Coated Perlite (EPC), Hydrophobic Perlite (EPH) and Premixed Perlite (EPM), containing less than 1 % by mass organic material as determined by Annex C.

This European Standard is a specification for the insulation products before installation.

This European 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 expanded perlite, and does not cover products intended to be used for the insulation of buildings.

The products covered by this standard are not intended to be used primarily for airborne sound insulation or sound absorption applications although they may improve the performance of the installation in these respects when installed for their primary insulation intended use.

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 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 — Part 14: 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 12086, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

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 13055-1, *Lightweight aggregates — Part 1: Lightweight aggregates for concrete, mortar and grout*

EN 13055-2, *Lightweight aggregates — Part 2: Lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications*

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

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

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

EN ISO 13787, *Thermal insulation products for building equipment and industrial installations — Determination of declared thermal conductivity (ISO 13787:2003)*

3 Terms and definitions, Symbols and Abbreviations

3.1 Terms and Definitions

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

3.1.1
expanded perlite
lightweight granular (insulation) material manufactured from naturally occurring volcanic rock expanded by heat to form a cellular structure

[EN ISO 9229]

3.1.2
perlite aggregate
expanded perlite with no treatment or surface coating, used as a loose insulation in cavities

3.1.3
coated perlite
expanded perlite which has a coating

3.1.4
hydrophobic perlite
expanded perlite which is treated to give specific hydrophobic properties and used where moisture or water repellency is required

3.1.5
premixed perlite
expanded perlite premixed with binders to form bonded materials in end use applications

3.1.6
level
given value which is the upper or lower limit of requirement, where the level is given by the declared value of the characteristic concerned

3.1.7
class
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

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3.2 Symbols and Abbreviations

3.2.1 Symbols 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	

3.2.2 Abbreviations used in this standard

EP	is expanded perlite as defined in 3.1.1
EPA	is perlite aggregate as defined in 3.1.2
EPC	is coated perlite as defined in 3.1.2
EPH	is hydrophobic perlite as defined in 3.1.2
EPM	is premixed perlite as defined in 3.1.2
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 resistance and thermal conductivity

Thermal conductivity shall be based upon measurements carried out in accordance with EN 12667 (limited to 110 °C) or EN 993-14 (this test is calibrated against EN 12667).

In each case the thermal conductivity values shall be determined by the manufacturer and verified in accordance with EN ISO 13787. They shall be declared by the manufacturer according to the above specified measurement standards covering the product service temperature range. The following conditions apply:

— measured values shall be expressed with three significant figures;

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

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

The declared equation/limit curve is the "declared reference" with three significant figures, that is to 0,0001 W/(m·K) for λ values below 0,1 W/(m·K) and in 0,001 W/(m·K) for λ values above 0,1 W/(m·K). This shall be used as a reference for the verification of the declaration.

When thermal conductivity is declared as a table derived from the equation, rounding upwards to the next 0,001 W/(m·K) has to be done for the full range of the thermal conductivity.

NOTE The declaration of the declared installed thermal resistance for an installed EP product is made in EN 15599-2)

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 expanded perlite products are in the range 30 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 4.2.3.3 and 4.2.3.4.

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 mm to 16 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 expanded perlite 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.

If required the organic content shall be determined according to the procedure given in Annex C.

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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 expanded perlite 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 expanded perlite does not change with time. Expanded perlite is a stable cellular structure.

4.2.5.5 Durability of thermal resistance against high temperature

The thermal conductivity of expanded perlite 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.

NOTE EN 14706 may be used for bonded products formed in end use application.

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. Expanded perlite is stable below 0 °C.

NOTE If a test is considered necessary this should be agreed between the parties.

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.

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4.3.5 Water vapour permeability

The water vapour permeability is determined in accordance with EN 12086.

4.3.6 Release of dangerous substances

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations for the member state of destination.

NOTE See Annex ZA.

4.3.7 Continuous glowing combustion

Where subject to regulations, the manufacturer shall declare the glowing combustion of the product. In the absence of a European test method, the compliance with the requirement shall be made on basis of the existing national test method.

NOTE 1 A test method is under development and the standard will be amended when this is available.

NOTE 2 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 3 Products with an organic content greater than 1 % are outside the scope of this standard.

If required the organic content shall be determined according to the procedure given in Annex C.

5 Test methods

5.1 Sampling

Sampling shall be carried out according to EN 932-1 and EN 932-2 using a procedure which gives a representative sample and avoids sampling bias.

5.2 Conditioning

No special conditioning of the sample shall be used unless otherwise specified in the test method standards. In case of dispute the test samples shall be conditioned to moisture equilibrium at (23 ± 5) ºC and (50 ± 10) % relative humidity after drying at (110 ± 5) ºC.

5.3 Testing

5.3.1 General

Table 1 indicates the test procedure, the minimum number of measurements required to get one test result and any specific conditions which are necessary.

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Table 1 —Test methods, measurements and conditions

Clause		Test method	Minimum number of measurements to get one test result	Specific conditions
No.	Title			
4.2.1	Thermal conductivity	EN 12667 or EN 993-14	1	See Annex B
4.2.2	Loose bulk density	EN 1097-3	3	See 4.2.2
4.2.3	Particle size	EN 933-1	1	See 4.2.3
4.3.7	Continuous glowing combustion	Annex C	1	None
4.3.2	Maximum service temperature	Annex D or EN 14706	1	None
4.3.4	Crushing resistance	EN 13055-1	1	None
4.3.5	Water vapour permeability	EN 12086	1	None

5.3.2 Thermal conductivity

Thermal conductivity shall be determined in accordance with EN 12667 or EN 993-14, under the following conditions:

— at different temperatures ranging from the minimum to the maximum service temperature;

— the lowest reference mean test temperature required is –10 ºC;

— after preparation in accordance with the procedure given in Annex B;

— after conditioning in accordance with 5.2;

— thickness of the test specimen shall be at least 10 times as thick as the mean aggregate size in the sample.

Specimen thicknesses of five times the mean aggregate size are permitted if it can be shown that the required accuracy of testing is obtained.

6 Designation Code

A designation code for the product shall be given by the manufacturer. The following shall be included except when there is no requirement for a property described in 4.3:

— Product abbreviation
— This EN 15599-1
— Loose bulk density LDi
— Particle size PS(x-y)
— Crushing resistance CR
— Maximum service temperature ST(+)i
— Minimum service temperature ST(-)i

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where “i” shall be used to indicate the relevant class or level, and (x-y) indicates the upper and lower sieve size.

The designation code for an expanded perlite product is illustrated by the following example:

EPA EN 15599-1- LD80 - PS(4-8) - ST(+)650 - ST(-)-200

7 Evaluation of conformity

7.1 General

The manufacturer or their authorised representative shall be responsible for the conformity of the product with the requirements of this European Standard. The evaluation of conformity shall be carried out in accordance with EN 13172 and shall be based on initial type tests, factory production control and tests on samples taken at the factory.

If a manufacturer decides to group their products it shall be done in accordance with EN 13172.

7.2 Initial type testing (ITT)

ITT shall be carried out in accordance with EN 13172 for all characteristics declared, except for thermal conductivity. ITT for the thermal conductivity curve shall be carried out according to EN ISO 13787.

For ITT testing of the λ curve and the maximum and minimum service temperatures only one test result is required using test specimens from four different production dates.

7.3 Factory production control (FPC)

FPC testing shall be made for the characteristics listed in Annex A.

The minimum frequencies of tests in the factory production control shall be in accordance with Annex A.

When indirect testing is used, the correlation to direct testing shall be established in accordance with EN 13172.

The manufacturer or his authorised representative shall make available, in response to a request, a certificate or declaration of conformity as appropriate.

8 Marking and labelling

Products complying with this standard shall be clearly marked, either on the package or on the delivery note, with at least the following information:

— product name or other identifying characteristic;

— name or identifying mark and address of the manufacturer or their authorised representative;

— production date and manufacturing plant or traceability code;

— reaction to fire class A1;

— declared thermal conductivity: reference to manufacturer’s literature, ML, showing thermal conductivity as a function of mean temperature, given as a table, curve or equation;

— designation code as given in Clause 6;

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— quantity of material (m^3).

NOTE For CE marking and labelling see ZA.3.

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Annex A
(normative)

Factory production control

Table A.1 —Minimum product testing frequencies

Clause		Minimum testing frequency[a)]		
No.	Title	Direct testing	Indirect testing	
			Test method	Frequency
4.2.1	Thermal conductivity	1 per 2 years or if significant change in raw material	Manufacturer's method	1 per week
4.2.2	Loose bulk density	1 per month	Manufacturer's method	1 per day
4.2.3	Particle size	1 per month	-	-
4.3.7	Continuous glowing combustion	1 per 2 years or if significant change in raw material	-	-
4.3.2	Maximum service temperature	1 per 2 years or if significant change in raw material	-	-
4.3.4	Crushing resistance	1 per 2 years or if significant change in raw material	-	-
4.3.5	Water vapour permeability	1 per 2 years or if significant change in raw material		
4.3.7	Dangerous substances	[b)]	-	-

[a)] The minimum testing frequencies, shall be understood as the minimum for each production unit. In addition to the testing frequencies given above, testing of relevant properties of the product shall be repeated when changes or modifications are made that are likely to affect the conformity of the product.

[b)] Frequencies are not given, as test methods are not yet available.

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Annex B
(normative)

Preparation of the test specimens to measure thermal conductivity

The general conditions of EN 12667 (limited to 110 °C) or EN 993-14 (calibrated against EN 12667) shall be complied with. In addition the following requirements shall be taken into account when conditioning and preparing samples of EPA, EPC, EPH and EPM for thermal conductivity testing.

Dry the sample at (110 ± 5) ºC and then condition at (23 ± 5) ºC and (50 ± 10) % RH. Repeat until constant weight is obtained.

Transfer the sample to the apparatus and commence the test without undue delay to avoid moisture uptake.

Test the sample without compaction of the loose-fill material and do not vibrate, pack or tamp the material.

With expanded perlite it is normal for the thermal conductivity testing using the guarded hotplate method to take several days to reach equilibrium. Treat with caution any apparent stability after only a few hours. However the hot wire method will reach equilibrium in a much shorter time period.

State in the test report the test method used, details of conditioning, the time taken to reach equilibrium, and the density of the material in place in the apparatus.

Tests on bonded insulation shall be carried out on samples prepared following the manufacturers instructions.

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Annex C
(normative)

Special conditions to be used for the determination of organic content

C.1 Principle

This Annex details the modifications required to enable the principles of EN 13820 to be used for testing the organic content of the thermal insulating product types EPC, EPH and EPM which contain expanded perlite. This contains water of hydration, and is therefore presently excluded from the scope of EN 13820.

The procedure given in EN 13820 shall be used, but a blank determination on a specimen of EPA which contains no added organic matter shall be run in parallel with the normal test specimen.

C.2 Apparatus

The apparatus as specified in EN 13820 shall be used with the exception of the aluminium tray given as an example of a test specimen container. This is not suitable and a stainless steel or silica tray shall be used instead.

C.3 Procedure

The procedure as detailed in EN 13820 shall be followed, with the additional requirement of running a parallel blank determination using a specimen of EPA. This blank specimen should be taken from the same batch / lot of expanded perlite prior to the addition of any additives or coatings. The blank determination will give the water of hydration of the expanded perlite and this can be deducted from the total weight loss of the test specimen.

C.4 Calculation and expression of results

As shown in EN 13820, the apparent M_{OC}, shall be calculated for both the test specimen (M_{OCT}) and the blank specimen (M_{OCB}). The organic content shall then be calculated as follows:

$$M_{OC} = M_{OCT} - M_{WH}$$

where

M_{OC} organic content of the test sample % by mass;

M_{OCT} organic content in the presence of water of hydration % by mass;

M_{WH} water of hydration % by mass;

To nearest 0,1 %by mass.

C.5 Test report

In addition to the requirements laid down in EN 13820, the test report shall also include the results of the blank determination (M_{WH}).

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Annex D
(normative)

Determination of maximum service temperature

D.1 Principle

The maximum service temperature of the free flowing expanded perlite products shall be determined in accordance with the following modifications to EN 14706 which, is primarily designed to test cohesive products, rather than free flowing products.

D.2 Apparatus

D.2.1 Electrically heated muffle furnace capable of maintaining temperatures of between 500 °C and 1100 °C within a tolerance of ± 50 °C.

D.2.2 Drying oven capable of maintaining a temperature of 110 °C ± 5 °C.

D.2.3 Heat resistant cylindrical or shallowly tapered crucible with, internal dimensions at least five times wider and deeper than the maximum particle size present in the sample.

D.2.4 Circular heat resistant pressure plate of clearance diameter so as to fit inside the crucible D.2.3. It shall be of sufficient thickness to provide a load of 100 ± 10 Pa.

D.2.5 Sliding depth gauge permitting a reading to an accuracy of ± 1,0 mm.

D.3 Procedure

A nominal 1 litre lot of the test material shall be conditioned before testing by drying it to constant mass at 110 °C ± 5 °C, after drying it is then conditioned under normal laboratory conditions of 23 °C ± 5 °C and 50 % ± 10 % RH until constant weight is obtained.

The crucible D.2.3 shall be filled using the test material as conditioned above to a level that allows the circular pressure plate D.2.4 to be installed flush with its rim without significant compaction.

Place the crucible containing the test material in to the preheated furnace for 1 h ± 5 %. After the 1 hr period open the furnace door and observe if the circular pressure plate has dropped below its position flush with the crucible rim.

The approximate maximum service temperature is initially determined by raising the furnace temperature in 50 °C incremental steps following the procedure above until a volume decrease of > 10 % has been observed.

The reported maximum service temperature shall be determined in triplicate using fresh test material after the approximate value has been determined as above. After each test the crucible and contents being removed from the furnace and allowed to cool to 23 °C ± 5 °C before measuring the volume change using the sliding depth gauge D.2.5.

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D.4 Test report

The maximum service temperature is reported as being the last incremental temperature prior to a volume change > 10 % having occurred.

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Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under a mandate M103[1] "Thermal insulation products" given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard, shown in this Annex, meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the expanded perlite covered by this European Standard for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the expanded perlite products falling within the scope of this European Standard.

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this Standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA
(accessed through http://ec.europa.eu./enterprise/construction/internal/dangsub/dangmain.htm).

This Annex establishes the conditions for the CE marking of the expanded perlite intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This Annex has the same scope as Clause 1 of this European Standard and is defined by Table ZA.1.

[1] As amended

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Table ZA.1 — Relevant clauses

Construction Products:	**In-situ thermal insulation formed from expanded perlite products as covered by the scope of this standard**			
Intended uses:	**Thermal insulation of building equipment and industrial installations**			
Requirement/Characteristic from the mandate	Requirement clauses in this European Standard		Levels and/or classes	Notes [a)]
Reaction to fire Euroclass characteristics	4.2.4	Reaction to fire	Euroclasses	-
Continuous glowing combustion	4.3.7	Continuous glowing combustion		
Release of dangerous substances to the indoor environment	4.3.6	Release of dangerous substances	-	-
Thermal resistance	4.2.1	Thermal conductivity	-	
	4.2.2	Loose bulk density	-	
	4.2.3	Particle size	-	
Water vapour transmission	4.3.5	Water vapour permeability	-	-
Compressive strength	4.3.4	Crushing resistance	-	-
Durability of reaction to fire against ageing/degradation	4.2.5.2	Durability of reaction to fire against ageing/degradation	-	-
Durability of thermal resistance against ageing/degradation	4.2.5.3	Durability of thermal resistance against ageing/degradation		
Durability of compressive strength against ageing/degradation	4.2.5.4	Durability of compressive strength against ageing/degradation	-	
Durability of thermal resistance against high temperature	4.2.5.5	Durability of compressive strength against high temperature		-

a) The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturer's placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option "No performance determined" (NPD) in the information accompanying the CE marking (see Clause ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.

ZA.2 Procedures for attestation of conformity of loose-fill expanded perlite products

ZA.2.1 Systems of attestation of conformity

For products having more than one of the intended uses specified in the following families, the tasks for the approved body, derived from the relevant systems of attestation of conformity, are cumulative.

The system of attestation of conformity for the expanded perlite products intended to be formed in-situ, indicated in Table ZA.1 in accordance with the decision of the European Commission 95/204/EC of 31.05.95 revised by decision 99/91/EC of 25.01.99 and by the Commission Decision 2001/596/EEC of 8 January 2001

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as given in Annex III of the mandate M103 as amended by mandates M126 and M130 is shown in Table ZA.2 for the indicated intended use(s).

Table ZA.2 - System(s) of attestation of conformity

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	Attestation of conformity System(s)
Thermal insulation products (Products intended to be formed in-situ)	For uses subject to regulations on reaction to fire	(A1 to E) [1)], F	Reaction to fire 4 Other characteristics 3
	Any other use	-	3
System 3: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility.			
System 4: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility.			
[1)] Products/materials that do not require to be tested for reaction to fire e.g. (Products/materials of classes A1 according to the Decision 96/603/EC, as amended).			

The attestation of conformity of the In-situ thermal insulation formed from expanded perlite products in Table ZA.1 shall be based on the evaluation of conformity procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standard indicated therein.

Table ZA.3 - Assignment of evaluation of conformity tasks for products under system 3 or system 3 combined with system 4

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant characteristics of Table ZA.1	subclause 7.3 of this standard, and clauses 1 to 5 and Annex C of EN 13172:2001
	Initial type testing by the manufacturer	- Those relevant characteristics of Table ZA.1 not tested by the notified body	subclause 7.2 of this standard
	Initial type testing by a notified test laboratory	- Thermal resistance - Release of dangerous substances - Compressive strength (for load bearing applications)	subclause 7.2 of this standard

ZA.2.2 EC declaration of conformity

When compliance with the conditions of this Annex is achieved, the manufacturer or their agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or their authorised representative established in the EEA, and place of production;

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NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if they take responsibility for CE marking.

— description of the product (type, identification, use,...), and a copy of the information accompanying the CE marking;

NOTE 2 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this EN);

— particular conditions applicable to the use of the product, (e.g. provisions for use under certain conditions, etc);

— name and address of the notified laboratory(ies);

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or their authorised representative.

The above mentioned declaration shall be presented in the official language or languages of the Member State in which the product is to be used.

ZA.3 CE Marking and labelling

The manufacturer or their authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EEC and shall be shown on the product itself, on the accompanying label or on the packaging. The following information shall accompany the CE marking symbol:

— name or identifying mark and registered address of the producer;

— last two digits of the year in which the marking is affixed;

— reference to this European Standard;

— description of the product, e.g. generic name;

— information on those relevant essential characteristics listed in Table ZA.1 which are to be declared as standard designation(s) in combination with declared values as described in Clause 8;

— no performance determined for characteristics where this is relevant.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.

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CE marking for expanded perlite products shall be accompanied by the information shown below:

CE	*CE conformity marking, consisting of the"CE"-symbol given in directive 93/68/EEC.* *Identification number of the certification body (for products under system 1).*
AnyCo Ltd, PO Box 21, B-1050 **10** 0123-CPD-00234	*Name or identifying mark and registered address of the producer* *Last two digits of the year in which the marking was affixed* *Certificate number (for products under system 1)*
EN 15599-1:2010 Expanded perlite Reaction to fire - Class A1 Continuous glowing combustion : NPD Thermal conductivity - See Manufacturer's Literature Compressive strength : xx N/mm^2 Water vapour permeability : yyy EPA EN 15599-1 LD80 - PS(4-8) – CR(zz)	*No. of European Standard with dated version* *Description of product* *And* *information on regulated characteristics* *Designation code (in accordance with Clause 6 for the relevant characteristics according to Table ZA.1)*

Optional information not part of the CE marking, e.g.:
Reaction to fire data corresponding to any end-use application configurations

Figure ZA.1 - Example CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE 1 European legislation without national derogation's need not be mentioned.

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NOTE 2 Affixing the CE marking symbol means, if a product is subject to more than one directive, that it complies with all applicable directives.

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[1] EN 14316-1, *Thermal insulation products for buildings — In-situ thermal insulation formed from expanded perlite (EP) products — Part 1: Specification for bonded and loose-fill products before installation*

[2] 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*

[3] EN 15599-2, *Thermal insulation products for building equipment and industrial installations — In-situ thermal insulation formed from expanded perlite (EP) products — Part 2: Specification for the installed products*

[4] EN ISO 9229, *Thermal insulation — Vocabulary (ISO 9229:2007)*

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