



EUROPEAN ASSESSMENT DOCUMENT

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INSULATION PRODUCT MADE OF EXPANDED PERLITE (EPB)

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1 SCOPE OF THE EAD

1.1 Description of the construction product

The construction product is a factory made thermal insulation board made of expanded perlite, hereinafter referred to as insulation board.

The insulation board consists of

- expanded perlite
- inorganic binding agents
- natural based thickening agents and
- possibly non-bituminous hydrophobic agents.

The product is not fully covered by the following harmonised technical specification: EN 13169:2012+A1:2015

The deviations from the standard are:

- The thermal insulation board does not contain reinforcing fibres (see clause 3.1.1 of EN 13169).
- The minimum value of 250 kPa for bending strength as required in the standard (see clause 4.2.6 of EN 13169) is not fulfilled by the product.

Multi-layered insulation products according to Annex D of EN 13169 and composite insulation boards according to Annex E of EN 13169 are not covered by this EAD.

Apart from the deviations mentioned above, the product corresponds to EN 13169. All other provisions, procedures and requirements of EN 13169 are applicable.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

The insulation board is used for the thermal insulation of buildings as follows (without contact to soil, ground- and surface water):

- Intended use 1: external and internal insulation of walls
- Intended use 2: insulation of floors and roofs (inside the waterproofing)

The EAD provides for assessment methods and criteria for the board only, not for kits made of this board.

If the insulation board is fixed by using adhesives and/or anchors, only such adhesions or anchors shall be used, which are suitable for this purpose. The assessment of these fixings is not subject of the European Technical Assessment.

The assessment methods and criteria in this EAD only provide for an appropriate assessment basis for the insulation product, if the product is protected from precipitation, wetting or weathering in built-in state and during transport, storage and installation, and if it will not be used for construction elements with contact to water and soil.

Concerning the application of the insulation board, the respective national regulations shall be observed.

The design level of thermal conductivity shall be laid down according to relevant national provisions.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the insulation board for the intended use of 50 years when installed in the works (provided that the insulation board is subject to appropriate installation (see 1.1)). These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works¹.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

¹ The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than the working life referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 1 shows how the performance of insulation board is assessed in relation to the essential characteristics.

Table 1 Essential characteristics of the product and assessment methods and criteria for the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	See clause 2.2.1	Class
Basic Works Requirement 3: Hygiene, health and the environment			
2	Content and/or release of dangerous substances	See clause 2.2.2	See clause 2.2.2
3	Water vapour transmission	See clause 2.2.3	Level (μ)
Basic Works Requirement 5: Protection against noise			
4	Sound absorption	See clause 2.2.4	See clause 2.2.4
Basic Works Requirement 6: Energy economy and heat retention			
5	Thermal conductivity	See clause 2.2.5	See clause 2.2.5
6	Dimensions/Geometry	See clause 2.2.6	Nominal level, tolerances
7	Water absorption	See clause 2.2.7	Level
8	Density	See clause 2.2.8	See clause 2.2.8
9	Bending strength	See clause 2.2.9	Level
10	Compressive stress/strength	See clause 2.2.10	Level
11	Deformation under specified load and temperature	See clause 2.2.11	Level
12	Dimensional stability (23 °C/ 90 % humidity)	See clause 2.2.12.1	Level
13	Dimensional stability (70 °C/ 50 % humidity)	See clause 2.2.12.2	Level

No	Essential characteristic	Assessment method	Type of expression of product performance
14	Tensile strength perpendicular to faces	See clause 2.2.13	Level
15	Compressive creep	See clause 2.2.14	Level
16	Behaviour under point load	See clause 2.2.15	Level

2.2 Assessment methods and criteria for the performance of the product in relation to essential characteristics of the product

For sampling, conditioning and testing (dimensions of the test specimens, minimum number of measurements, specific conditions), EN 13169 shall apply, unless otherwise is specified in the following.

The test specimens shall be chosen to cover the intended product parameter (thickness and density range).

2.2.1 Reaction to fire

The insulation board shall be tested, using the test method(s) relevant for the corresponding reaction to fire class, in order to be classified according to EN 13501-1.

The instructions for mounting and fixing according to EN 15715 using the product specific details for expanded perlite (tables A.34 and A.35) shall be used for reaction to fire testing.

If possible (e.g. products with an organic content < 1,0 %), the insulation board is considered to satisfy the requirements for performance class A1 of the characteristic reaction to fire, in accordance with the provisions of EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.

The product shall be classified according to EN 13501-1.

2.2.2 Content, emission and/or release of dangerous substances

The performance of the product related to the emissions and/or release and, where appropriate, the content of dangerous substances will be assessed on the basis of the information provided by the manufacturer² after identifying the release scenarios (in accordance with EOTA TR 034) taking into account the intended use of the product and the Member States where the manufacturer intends his product to be made available on the market.

² The manufacturer may be asked to provide to the TAB the REACH related information which he must accompany the DoP with (cf. Article 6(5) of Regulation (EU) No 305/2011).

The manufacturer is **not** obliged:

- to provide the chemical constitution and composition of the product (or of constituents of the product) to the TAB, or
- to provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS.

Any information provided by the manufacturer regarding the chemical composition of the products may not be distributed to EOTA or to TABs.

The identified intended release scenarios for this product and intended use with respect to dangerous substances are:

- IA2: Product with indirect contact to indoor air (e.g. covered products) but possible impact on indoor air.

SVOC and VOC

For the intended use covered by the release scenario IA2 semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) are to be determined in accordance with EN 16516. The loading factor to be used for emission testing is taken from the following table:

Table 2 Loading factor L, depending on the product type (in accordance with EN 16516)

Intended use	Loading factor [m ² /m ³]
Walls	1,0
Floor, ceiling	0,4

The test specimen presents the maximum thickness and is appropriate to the size of the test chamber. The edges of the product should be sealed with self-adhesive, VOC-free aluminum foil or using a suitable frame. It has to be ensured that no emission derives from the back side.

Once the test specimen has been produced, as described above, it should immediately be placed in the emission test chamber. This time is considered the starting time of the emission test.

The test results have to be reported for the relevant parameters (e.g. chamber size, temperature and relative humidity, air exchange rate, loading factor, size of test specimen, use of hydrophobic agents, conditioning, production date, arrival date, test period, test result) after 3 and 28 days testing.

The relevant test results shall be expressed in [mg/m³] and stated in the ETA.

2.2.3 Water vapour transmission

The water vapour permeability (water vapour diffusion resistance factor) shall be determined in accordance with EN 13169.

The water vapour diffusion resistance factor μ shall be stated in the ETA.

2.2.4 Sound absorption

The sound absorption characteristics shall be determined in accordance with EN 13169.

The sound absorption characteristics shall be stated in the ETA in accordance with EN 13169.

2.2.5 Thermal conductivity

The thermal conductivity at a temperature of 10 °C shall be determined according to EN 12667 or EN 12939 for thick products in accordance with EN 13169. At least 4 measurements shall be performed.

The thermal conductivity at 23 °C and 50 % relative humidity $\lambda_{D(23,50)}$, representing at least 90 % of the production with a confidence level of 90 %, shall be determined on the basis of the measuring results following EN 13169, clause 4.2.1 and shall be stated in the ETA.

For the conversion of the thermal conductivity to a moisture content at 23 °C/ 80 % relative humidity the moisture conversion factor F_m shall be given in the ETA based on the following values according to EN ISO 10456:

- moisture content mass by mass at 23 °C/ 50 % relative air humidity: $u_{23/50} = 0,02$ kg/kg
- moisture content mass by mass at 23 °C/ 80 % relative air humidity: $u_{23/80} = 0,03$ kg/kg
- moisture conversion coefficient mass by mass $f_u = 0,8$

Alternatively the moisture conversion factor F_m shall be determined in principle accordance with EN 13169, Annex C.

2.2.6 Dimensions/Geometry

2.2.6.1 Method of determination

The length and width of the insulation board shall be determined in accordance with EN 822.

The thickness d shall be determined according to EN 823, using a load equal to 250 ± 5 Pa.

The squareness shall be determined according to EN 824, the flatness according to EN 825.

2.2.6.2 Method of assessing

The nominal length and width shall be given in the ETA. No test result shall deviate from the nominal length and width by more than the following:

± 3 mm for length and width not exceeding 1200 mm,

± 5 mm for length and width exceeding 1200 mm

The nominal thickness d shall be given in the ETA. No test result shall deviate from the nominal thickness d_N by more than the tolerances given in the following Table 3:

Table 3 Tolerances depending on nominal thickness

Nominal thickness	$d_N \leq 35$ mm	$35 < d_N \leq 70$ mm	$70 < d_N \leq 120$ mm	$d_N > 120$ mm
Tolerance	± 1 mm	± 2 mm	± 3 mm	± 4 mm

The deviation from the squareness in the direction of length and width shall not exceed 3 mm/m.

The deviation from the flatness shall not exceed the following:

3 mm for length and width not exceeding 1200 mm,

5 mm for length and width exceeding 1200 mm

2.2.7 Water absorption

Short-term water absorption by partial immersion

Short-term water absorption by partial immersion shall be determined according to EN 1609.

The water absorption W_p shall be given in the ETA. No test result shall exceed the stated level.

Short-term water absorption by total immersion

Short-term water absorption by total immersion shall be determined according to EN 13169.

The level of water absorption W_{st} shall be given in the ETA. No test result shall exceed the level, given in EN 13169.

2.2.8 Density

The density is to be determined according to EN 1602.

The density range of the product shall be given in the ETA.

2.2.9 Bending strength

Bending strength shall be determined according to EN 12089.

The bending strength shall be stated in the ETA defined as a minimum measured result.

2.2.10 Compressive stress or compressive strength

Compressive stress at 10 % deformation or compressive strength shall be determined according to EN 826.

The compressive stress shall be given in the ETA. No test result shall be less than the level, given in EN 13169.

2.2.11 Deformation under specified load and temperature

Deformation in thickness under specified load and temperature shall be determined according to EN 1605.

The level shall be given in the ETA. The relative deformation shall not exceed the level, given in EN 13169.

2.2.12 Dimensional stability under specified temperature and humidity conditions

Dimensional stability at (23 ± 2) °C and (90 ± 5) % relative humidity

The determination of the dimensional stability under specified temperature and humidity conditions shall be carried out according to EN 1604. Testing shall be performed after a 48h storage at (23 ± 2) °C and (90 ± 5) % relative humidity.

The relative change of dimensions in length $\Delta\varepsilon_l$, in width $\Delta\varepsilon_b$ and in thickness $\Delta\varepsilon_d$ shall be given in % in the ETA and shall not exceed 0,5 % for length and width as well as 1 % for thickness.

Dimensional stability at (70 ± 2) °C and (50 ± 5) % relative humidity

The determination of the dimensional stability under specified temperature and humidity conditions shall be carried out according to EN 1604. Testing shall be performed after a 48h storage at (70 ± 2) °C and (50 ± 5) % relative humidity.

The relative change of dimensions in length $\Delta\varepsilon_l$, in width $\Delta\varepsilon_b$ and in thickness $\Delta\varepsilon_d$ shall be given in % in the ETA and shall not exceed 0,5 % for length and width as well as 1 % for thickness.

2.2.13 Tensile strength perpendicular to faces

The determination of the tensile strength perpendicular to faces, σ_{mt} , shall be carried out according to EN 1607 using the additional provisions of EN 13169.

The tensile strength perpendicular to faces, σ_{mt} , shall be stated in the ETA in kPa, as a minimum measured result not being less than 20 kPa.

2.2.14 Compressive creep

The determination of compressive creep and the total thickness reduction shall be determined in accordance with EN 13169.

The compressive creep and the total thickness reduction shall be stated in the ETA at the stress in accordance with EN 13169.

2.2.15 Behaviour under point load

The determination of the point load at 2 mm deformation shall be carried out according to EN 12430.

The point load at 2 mm deformation shall be stated in the ETA in levels with steps of 50 N. No test result shall be less than the stated level.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is: Decision 1999/91/EC of the European Commission.

The system is: 3 for any use except for uses subject to regulations on reaction to fire.

For uses subject to regulations on reaction to fire the applicable AVCP systems are 1, or 3, or 4 depending on the conditions defined in the said Decision.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the process of assessment and verification of constancy of performance are laid down in Table 4.

Table 4 Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]					
1	The factory production control shall be performed in accordance with the provisions in EN 13169	see EAD, clause 2.2 and EN 13169	see EAD, clause 2.2 and EN 13169	see EN 13169	see EN 13169

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body of the product in the process of assessment and verification of constancy of performance are laid down in Table 5.

The intervention of the notified body is only necessary in so far as the conditions for the applicability of system 1 as defined in Decision 1999/91/EC are fulfilled.

Table 5 Control plan for the notified body; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control <i>(for system 1 only)</i>					
1	Reaction to fire	Presence of suitable test equipment			
		Presence of trained personnel			
		Presence of an appropriate quality assurance system and the necessary stipulations			
Continuous surveillance, assessment and evaluation of factory production control <i>(for system 1 only)</i>					
2	Reaction to fire	Inspection of factory, of the production of the product and of the facilities for factory production control			Annually
		Evaluation of the documents concerning factory production control			Annually
		Issuing a report of surveillance			Annually

4 REFERENCE DOCUMENTS

As far as no edition date is given in the list of standards thereafter, the standard in its current version at the time of issuing the European Technical Assessment is of relevance.

EN 822	Thermal insulating products for building applications - Determination of length and width
EN 823	Thermal insulating products for building applications - Determination of thickness
EN 824	Thermal insulating products for building applications - Determination of squareness
EN 825	Thermal insulating products for building applications - Determination of flatness
EN 826	Thermal insulating products for building applications - Determination of compression behaviour
EN 1602	Thermal insulating products for building applications - Determination of the apparent density
EN 1604	Thermal insulating products for building applications - Determination of dimensional stability under specified temperature and humidity conditions
EN 1605	Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature conditions
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 ISO 10456	Building materials and products –Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal Values
EN 12089	Thermal insulating products for building applications - Determination of bending behaviour
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 13169	Thermal insulation products for buildings – Factory made expanded perlite board (EPB) products - Specification
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	Thermal insulation products – Instructions for mounting and fixing for reaction to fire testing – Factory made products
EOTA TR 034	General BWR 3 Checklist for EADs/ETAs - Content and/or release of dangerous substances in construction products
EN 16516	Construction products – Assessment of release of dangerous substances – Determination of emissions into indoor air