



EUROPEAN ASSESSMENT DOCUMENT

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**THERMAL INSULATION AND
SOUND ABSORBING
RENDERING/PLASTERING**

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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) No 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

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1 SCOPE OF THE EAD

1.1 Description of the construction product

This European Assessment Document applies to factory-made thermal insulation and sound absorbing rendering/plastering mortar based on inorganic binders and aggregates for external and internal use on walls and ceilings.

The product can include additional admixtures as aerogel, hydrophobic agents and pore forming material.

The rendering/plastering can be applied manually or by fettling machines.

The product is not covered by a harmonised European standard (hEN).

Note:

Although EN 998-1 also covers rendering and plastering mortars, the high-performance insulating plasters with sound absorption properties according to this EAD are not comparable with the products covered by EN 998-1:

- *The insulating properties of high-performance insulating plasters are not adequately covered by EN 998-1, as assessment methods contained in the harmonised standard are not relevant for the peculiarities of the product covered by this EAD. The assessment methods concerning thermal conductivity according to EN 998-1 are not sufficient for the low thermal conductivities (e.g., 0.028 W/m·K) of the products covered by this EAD which are often based on aerogel and can be affected by ageing. In contrast to EN 998-1, the EAD allows a proper assessment of the product performances concerned.*
- *EN 998-1 does not include sound absorption.*
- *EN 998-1 does not include hygroscopic sorption properties.*
- *Compressive strength is not included in EN 998-1, Annex ZA.*

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 of the construction product

1.2.1 Intended use

The thermal insulation and sound absorbing rendering/plastering is intended to be used for external and internal insulation on walls and ceilings.

In case of external use, the thermal insulation and sound absorbing rendering/plastering is used in conjunction with a water-repellent final coat.

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 thermal insulation and sound absorbing rendering/plastering for the intended use of 50 years when installed in the works. 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.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

All undated references to standards or to EADs in this EAD are to be understood as references to the dated versions listed in chapter 4.

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the thermal insulation and sound absorbing rendering/plastering is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing 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	2.2.1	Class
Basic Works Requirement 4: Safety and accessibility in use			
2	Dry bulk density	2.2.2	Level
3	Compressive strength	2.2.3	Level
4	Adhesion	2.2.4	Level
5	Adhesion after weathering cycles (for products intended to be used as external rendering)	2.2.5	Level
Basic Works Requirement 5: Protection against noise			
6	Sound absorption	2.2.6	Level
Basic Works Requirement 6: Energy economy and heat retention			
7	Capillary water absorption (for products intended to be used as external rendering)	2.2.7	Level
8	Water permeability on relevant substrates after weathering cycles (for products intended to be used as external rendering)	2.2.8	Level
9	Water vapour permeability (water vapour diffusion coefficient μ)	2.2.9	Level
10	Thermal conductivity	2.2.10	Level
11	Hygroscopic sorption properties	2.2.11	Level

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 referred to above.

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

For sampling, conditioning and testing EN 1015-2 shall apply, unless otherwise is specified in the following. The specimens shall cover the range of density and thicknesses in built-in state.

2.2.1 Reaction to fire

The thermal insulation and sound absorbing rendering/plastering is tested using the test method(s) according to EN 13501-1 and relevant for the corresponding reaction to fire class. The product shall be classified according to Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

The thermal insulation and sound absorbing rendering/plastering is considered to satisfy the requirements for performance class A1 of the characteristic reaction to fire in accordance with the Decision 96/603/EC without the need for testing if it fulfils the conditions set out in that Decision and its intended use being covered by that Decision. In this case, the performance of the product is A1.

2.2.2 Dry bulk density

The dry bulk density is tested according to EN 1015-10. The density range is given in the ETA in kg/m³.

2.2.3 Compressive strength

The compressive strength is tested according to EN 1015-11 and given in the ETA in N/mm².

In addition for products with aerogel intended to be used as external rendering:

The compressive strength is tested in addition after weathering cycles according to EN 1015-21, clause 6.3. Deviating from EN 1015-21, after the storage of at least 28 days at a temperature of (20±2)°C and a relative humidity of (65±5)% only series of tests 1 (four temperature cycles) followed by storage for at least 48 h at (20±2)°C and a relative humidity of (65±5)% is performed. The compressive strength after weathering cycles is also given in the ETA in N/mm².

2.2.4 Adhesion

The adhesion is tested according to EN 1015-12 and given in the ETA in N/mm² together with the fracture pattern (FP).

2.2.5 Adhesion after weathering cycles (for products intended to be used as external rendering)

The adhesion after weathering cycles is tested according to EN 1015-21 and given in the ETA in N/mm² together with the fracture pattern (FP). Deviating from EN 1015-21, clause 6.3, after the storage of at least 28 days at a temperature of (20±2)°C and a relative humidity of (65±5)% only series of tests 1 (four temperature cycles) followed by storage for at least 48 h at (20±2)°C and a relative humidity of (65±5)% is performed.

2.2.6 Sound absorption

The determination of the sound absorption coefficient α_s is performed according to EN ISO 354. Mounting option B.6 according to Annex B of EN ISO 354 is used. The sound absorption characteristics α_p and α_w are calculated according to EN ISO 11654.

The obtained values α_p and α_w are rounded to the nearest 0.05 (α_p larger than 1 shall be expressed as $\alpha_p = 1$).

The values of α_p [-] as a table or a graph and the weighted sound absorption coefficient α_w [-] as a single number value are stated in the ETA.

2.2.7 Capillary water absorption (for products intended to be used as external rendering)

The capillary water absorption is tested according to EN 1015-18 and given in the ETA in kg / (m²·min^{0.5}).

Depending on the mortar category, the relevant period of post-treatment according to EN 1015-18, Table 1 shall be applied.

2.2.8 Water permeability on relevant substrates after weathering cycles (for products intended to be used as external rendering)

The water permeability on relevant substrates after weathering cycles is tested according to EN 1015-21 and given in the ETA in ml/cm² after 48 h. Deviating from EN 1015-21, clause 6.3, after the storage of at least 28 days at a temperature of (20±2)°C and a relative humidity of (65±5)% only series of tests 1 (four temperature cycles) followed by storage for at least 48 h at (20±2)°C and a relative humidity of (65±5)% is performed.

2.2.9 Water vapour permeability (water vapour diffusion coefficient)

The water vapour permeability coefficient (μ) is tested according to EN 1015-19 and given in the ETA*.

Depending on the mortar category, the relevant storage period and hardening conditions according to EN 1015-19, Table 1 shall be applied.

* The method given in EN 1015-19 determines water vapour permeability W_{vp} in kg/ (m·s·Pa). The calculation of μ from W_{vp} is performed using the following equation: $\mu = 1.94E-10/W_{vp}$.

2.2.10 Thermal conductivity

The thermal conductivity at a reference mean temperature of 10 °C after storing the specimen in a climate of 23 °C and 50 % relative humidity until constant mass is determined in accordance with EN 12667 (in case of a thermal resistance of at least 0.5 m² K/W) or EN 12664 (in case of a thermal resistance lower than 0.5 m² K/W). At least 4 measurements at test specimens of 500 mm x 500 mm are performed.

The test specimen shall be sufficient smooth and plane-parallel. During the measurement, precaution is taken to avoid moisture absorption by the specimen.

The thermal conductivity λ_D , based on $\lambda_{90/90}$ (following the principles for the determination of thermal conductivity given in EN ISO 10456), is given in the ETA for a moisture content at 23 °C and 50 % relative humidity in levels with steps of 0.001 W/(m·K).

In addition, for products with aerogel intended to be used as external rendering:

The thermal conductivity is tested in addition after weathering cycles according to EN 1015-21, clause 6.3. Deviating from EN 1015-21, clause 6.3, after the storage of at least 28 days at a temperature of (20±2)°C and a relative humidity of (65±5)% only series of tests 1 (four temperature cycles) followed by storage for at least 48 h at (20±2)°C and a relative humidity of (65±5)% is performed. At least 3 specimens from having done the measurements in a climate of 23 °C and 50 % relative humidity are used. The ageing conversion factor F_a is calculated using the mean values of thermal conductivity before and after weathering cycles.

An ageing conversion factor $F_a = 1.05$ can be assumed without testing.

The influence of ageing is considered by multiplying $\lambda_{90/90}$ by the ageing conversion factor F_a before determining λ_D .

Moisture conversion factor F_m

The influence of humidity on the thermal conductivity is determined by storing at least 3 specimens from having done the measurements in a climate of 23 °C and 50 % relative humidity in a climate of 23 °C and 80 % relative humidity until constant mass followed by measurements in accordance with EN 12667.

For each climate the moisture content mass by mass ($u_{23,50} / u_{23,80}$) is determined beside the thermal conductivity ($\lambda_{10,(23,50)} / \lambda_{10,(23,80)}$).

The moisture conversion factor F_m for the conversion of $\lambda_{23,50}$ to $\lambda_{23,80}$ is calculated using the mean values of thermal conductivity of each climate and given in the ETA.

2.2.11 Hygroscopic sorption properties

The moisture absorption is determined according to EN ISO 12571, clause 7.3 (climate chamber method). Deviating from EN ISO 12571, tests at 23 °C and 50 % relative humidity as well as at 23 °C and 80 % relative humidity (absorption according to EN ISO 12571, clause 4.1) are sufficient. The mass-related moisture content u at 23 °C and 50 % relative humidity as well as at 23 °C and 80 % (absorption) is given in the ETA.

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.

The applicable AVCP 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 regarding reaction to fire 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 procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

Table 3.2.1 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)					
1	Reaction to fire	EN 13501-1	According to control plan	According to control plan	Every two years
2	Dry bulk density	EN 1015-10	According to control plan	According to control plan	Once per manufacturing day
3	Compressive strength	EN 1015-11	According to control plan	According to control plan	Once per month
4	Adhesion	EN 1015-12	According to control plan	According to control plan	Once per year
5	Adhesion after weathering cycles (for products intended to be used as external rendering)	EN 1015-21	According to control plan	According to control plan	Every two years
6	Capillary water absorption (for products intended to be used as external rendering)	EN 1015-18	According to control plan	According to control plan	Every three months
7	Water permeability on relevant substrates after weathering cycles (for products intended to be used as external rendering)	EN 1015-21	According to control plan	According to control plan	Every two years
8	Water vapour diffusion coefficient (μ)	EN 1015-19	According to control plan	According to control plan	Once per year
9	Thermal conductivity	EN 12667 / EN 12664	According to control plan	According to control plan	Twice per year
10	Hygroscopic sorption properties	EN ISO 12571	According to control plan	According to control plan	Once per year

3.3 Tasks of the notified body

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire for products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material).

The cornerstones of the actions to be undertaken by the notified body of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.3.1.

Table 3.3.1 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					
1	The notified body shall verify the ability of the manufacturer for a continuous and orderly manufacturing of the product *. In particular the following items shall be appropriately taken into account: <ul style="list-style-type: none"> – personnel and equipment – the suitability of the factory production control established by the manufacturer – full implementation of the prescribed test plan – a limiting of organic material and/or – the addition of fire retardants. 	Presence of suitable test equipment Presence of trained personnel Presence of an appropriate factory production control system and the necessary stipulations	According to control plan	-	Before certification
Continuous surveillance, assessment and evaluation of factory production control					
2	The notified body shall verify that the system of factory production control and the specified manufacturing process are maintained, taking into account especially <ul style="list-style-type: none"> – personnel and equipment – the suitability of the factory production control established by the manufacturer – full implementation of the prescribed test plan – a limiting of organic material and/or – the addition of fire retardants*. 	Evaluation of the documents concerning factory production control Issuing a report of surveillance	According to control plan	-	Annually

* Only relevant for products of class C and higher.

4 REFERENCE DOCUMENTS

EN 1015-2:1998+A1:2006	Methods of test for mortar for masonry - Part 2: Bulk sampling of mortars and preparation of test mortars
EN 1015-10:1999+A1:2006	Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar
EN 1015-11:2019	Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar
EN 1015-12:2016	Methods of test for mortar for masonry - Part 12: Determination of adhesive strength of hardened rendering and plastering mortars on substrates
EN 1015-18:2002	Methods of test for mortar for masonry - Part 18: Determination of water absorption coefficient due to capillary action of hardened mortar
EN 1015-19:1998+A1:2004	Methods of test for mortar for masonry - Part 19: Determination of water vapour permeability of hardened rendering and plastering mortars
EN 1015-21:2002	Methods of test for mortar for masonry - Part 21: Determination of the compatibility of one-coat rendering mortars with substrates
EN 12664:2001	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products with medium and low thermal resistance
EN 12667:2001	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 ISO 354:2003	Acoustics - Measurement of sound absorption in a reverberation room
EN ISO 10456:2007+AC:2009	Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values
EN ISO 11654:1997	Acoustics - Sound absorbers for use in buildings - Rating of sound absorption
EN ISO 12571:2021	Hygrothermal performance of building materials and products - Determination of hygroscopic sorption properties
EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests