

EUROPEAN ASSESSMENT DOCUMENT

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**THERMAL INSULATION
PRODUCTS FOR BUILDINGS WITH
RADIANT HEAT REFLECTIVE
COMPONENTS**

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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

Thermal insulation product that derives a proportion of its claimed thermal properties from the presence of one or more reflective or low emissivity surfaces together with any associated airspace(s).

The insulation product can be treated with a flame retardant.

These layers may be glued, seamed, stitched, needled, welded, and perforated. When vegetable or animal fibres are incorporated in the product, the relevant EAD shall also be applied for the concerned layers.

The additional thermal performance, due to emissivity of their reflective faces (alu-facings/foils/films) when they are in contact with an air space or product components, which are already covered by existing harmonized standards (e.g. MW, EPS, PU, PF, CG, Wood based panels, roof underlay, vapour control layers, sandwiches panels, ...etc.) can be assessed on the basis of this EAD.

The thermal resistance of the product itself is designated by core thermal resistance (or intrinsic thermal resistance). It is the measured value of the product without neighbouring air spaces.

The product is joined during installation with special adhesive tape, which should be specified in the ETA. This adhesive tape shall have an emissivity which is equal to the emissivity of the reflective foil it is used on.

The type(s) of various layers of insulation product are to be stated in the ETA.

The nature and the amount of the binding agent and the supporting/binding fibres (e.g. synthetic fibres) are to be stated in the ETA.

The nature of the facing is to be stated in the ETA.

In addition to the thermal characteristic, if relevant it may also be required to characterize the acoustic characteristic for some applications. It is therefore proposed in this document to assess the acoustic characteristic where relevant. In these cases the product can also be used without the neighbouring air spaces.

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

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 intended use of the reflective products is as thermal insulation when they are incorporated in systems of construction.

The products are used for walls, ceilings, floors, or roofs, for which precise specifications define how the air voids are designed and executed in order to create non ventilated spaces in contact with the product.

The assessment of the insulation product only applies if the product is used in structures where it will not be exposed to precipitation, wetting or weathering and for construction elements with no contact to water and soil or in constructions with no risk that the critical moisture content will be exceeded.

Specific provisions:

The specifications of implementation for each construction must comply with the code of practice and national regulations.

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 product for the intended use of 25 years when installed in the works (provided that the thermal insulation product 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 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 product is established in relation to the essential characteristics.

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

No	Essential characteristic	Method of verification and assessment	Expression of product performance (value, class, criterion, etc.).
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	See clause 2.2.1	Fire class (EN 13501-1)
Basic Works Requirement 3: Hygiene, health and the environment			
2	Biological resistance	See clause 2.2.2	Level (if relevant). Not relevant for products made out of film or PE/PP foam or other plastic foams
Basic Works Requirement 4: Safety and accessibility in use			
3	Corrosion developing capacity	See clause 2.2.3	Pass/fail (for specific applications only)
Basic Works Requirement 5: Protection against noise			
4	Specific airflow resistivity	See clause 2.2.4	Level (if relevant, for acoustics application), AFr (kPa.s/m ²)
5	Dynamic stiffness	See clause 2.2.5	Level (if relevant, for acoustics application), s' (MN/m ³)
6	Impact sound reduction	See clause 2.2.6	Level (if relevant, for acoustics application), ΔL_w (dB),
7	Compressibility	See clause 2.2.7	Level (if relevant, for acoustics application), $c = dL - dB$ (mm)
8	Sound absorption	See clause 2.2.8	Level (if relevant, for acoustics application), α_p
Basic Works Requirement 6: Energy economy and heat retention			
9	Thermal core resistance	See clause 2.2.9	Level (RD, m ² .K/W)
10	Durability of thermal resistance against ageing/ degradation	See clause 2.2.10	
11	Emissivity	See clause 2.2.11	Level (ϵ_D)
12	Water vapour diffusion resistance	See clause 2.2.12	Level (μ or Sd (m))
13	Water absorption	See clause 2.2.13	Level (if relevant), Wp or Wlp (kg/m ²)
14	Watertightness	See clause 2.2.14	Level (if relevant), Wi
15	Geometry	See clause 2.2.15	Nominal values, tolerances

No	Essential characteristic	Method of verification and assessment	Expression of product performance (value, class, criterion, etc.).
16	Apparent density/Mass per unit area	See clause 2.2.16	Level , tolerances (kg/m ²)
17	Squareness	See clause 2.2.17	Level (if relevant), S _b (mm/m)
18	Compressive stress or strength for products exposed to compression loads	See clause 2.2.18	Level (if relevant), σ_{10} , or σ_m ,
19	Dimensional stability	See clause 2.2.19	Level (if relevant), $\Delta\epsilon_i$, $\Delta\epsilon_b$, and $\Delta\epsilon_d$ (%)
20	Tensile strength parallel to faces	See clause 2.2.20	Level (if relevant), (N)
21	Tensile strength perpendicular to faces	See clause 2.2.21	Level (if relevant), σ_t (kPa)
22	Resistance to tearing	See clause 2.2.22	Level (if relevant), (N)
23	Peel Strength or mechanical resistance of adhesive tape	See clause 2.2.23	Level (if relevant), (N)
24	Compressive creep for products exposed to compression load	See clause 2.2.24	Level (if relevant), X _t (mm), X _{ct} (mm), σ_c (%)
25	Behaviour under point load for products exposed to compression load	See clause 2.2.25	Level (if relevant), F _p , (N)

2.2 Methods and criteria for assessing 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 13171 (§5) shall apply, unless otherwise specified in the following. The value to be declared for each characteristic has to be representative for the range of density and thicknesses. The test specimens shall be chosen accordingly (number of test specimens, thickness and density of test specimens).

Indications on the required content of the ETA with regard to the performances of the product are related to the way of expressing the product's performances in case the manufacturer wants to make the relevant declaration.

2.2.1 Reaction to fire

The insulation product shall be tested according to the method(s) referred to in EN 13501-1 and relevant for the corresponding reaction to fire class. The product shall be classified according to the Commission Delegated Regulation (EU) No 2016/364.

For mounting and fixing, EN 15715 (§.5) and Annex A shall be applied.

The fire class shall be stated in the ETA.

2.2.2 Biological resistance

Not relevant for products made out of film or PE/PP foam or other plastic foams.

For component products made out of vegetable or animal fibres layers, the determination shall be carried out according to EAD "Factory-made thermal and/or acoustic insulation products made of vegetable or animal fibres".

2.2.3 Corrosion developing capacity

The test allows checking the product facing behaviour towards corrosion when it comes in contact with chloride atmospheres actions (for example salt fog).

The test shall be carried out according to ISO 9227, T3: “Corrosion tests in artificial atmospheres – Salt spray tests”.

The test specifies the neutral salt spray (NSS), acetic acid salt spray (AASS) and copper accelerated acetic acid salt spray (CASS) tests for assessment of the corrosion resistance of metallic materials with or without permanent corrosion protection or temporary corrosion protection. Using NSS testing is enough to check the product corrosion.

The result shall be specified in the ETA, taking in account durability aspects

2.2.4 Specific airflow resistivity

For acoustic applications, specific airflow resistivity is determined as following:

Determination of the specific airflow resistivity shall be carried out according to EN 29053 (ISO 9053), method A.

Where relevant, the airflow resistance, A_{Fr} , shall be given in the ETA. The value of the air flow resistance should be expressed in levels; in steps of 1 kPa·s/m².

NOTE: The specific airflow resistivity is determined for quality control reasons to ensure that the acoustic properties (determined by national test methods) of the building elements incorporating reflective products remain the same.

2.2.5 Dynamic stiffness (for impact sound insulation product only)

For acoustic applications, dynamic stiffness s' shall be carried out according to EN 29052-1.

At least minimum and maximum insulation product thickness shall be tested.

Where relevant, value s' for different insulation product and different thickness shall be given in the ETA in levels using steps of 1 MN/m³.

2.2.6 Impact sound reduction (for impact sound insulation product only)

For acoustic applications, impact sound reduction ΔL by floating screeds on a heavyweight standard floor using the insulation product shall be determined according to the relevant parts of EN ISO 10140-1 and 3 (category II).

Using this data the weighted impact sound reduction ΔL_w is calculated according to EN ISO 717-2.

Test shall be performed with the floor build-up representing the worst case for impact sound reduction (e. g. minimum mass per unit area of the floating screed and thinnest insulation layer covered by the ETA). If need be, the tests shall be carried out with several build-ups.

The weighted impact sound reduction ΔL_w (if need be, for different build-ups) shall be stated in the ETA considering a reduction of 2 dB to take influence of ageing into account:

The assessed floor build-up shall be described in detail in the ETA. It shall be stated clearly to which floor build-up the impact sound reduction applies. In particular, where relevant, the minimum mass per unit area of the screed shall be given in the ETA.

2.2.7 Compressibility (for impact sound insulation product only)

For acoustic applications, compressibility is determined as following:

The determination of thickness d_L and d_B shall be carried out according to EN 12431 with maximum insulation product thickness and a pause of 120 s before measuring d_B .

The compressibility c is defined as follows: $c = d_L - d_B$

Where relevant, the value c shall not be greater than $c = 5$ mm according to EN 13171.

2.2.8 Sound absorption (sound absorption index)

For acoustic applications, sound absorption coefficient shall be performed according to EN ISO 354. The sound characteristics shall be calculated according to EN ISO 11654, using the values for the sound absorption coefficient α_p , at the frequencies: 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz and the single number value for the weighted sound absorption coefficient α_w .

Obtained values for α_p and α_w shall be rounded to the nearest 0,05 (α_p larger than 1 shall be expressed as $\alpha_p = 1$).

Where relevant, the values for α_p and α_w shall be stated in the ETA in levels with steps of 0,05.

2.2.9 Thermal core resistance

Thermal core resistance shall be based upon measurements carried out and assessed in accordance with EN 16012 (§5).

Thermal resistance shall be determined according to the following:

- reference mean temperature shall be 10 °C;
- conditioning of specimen for measurement: 23°C/50% RH
- measured values shall be expressed with three significant figures;
- thermal resistance value, R_D , shall be given as a limit value representing at least 90 % of the production, determined with a confidence level of 90 %;
- thermal resistance value, R_D , shall be based upon the nominal thickness, d_N , or the measured thickness d_L whichever is the lesser thickness;
- statistical value of thermal resistance, $R_{90/90}$, shall be rounded downwards to the nearest 0,05 m²·K/W, and in levels with steps of 0,05 m²·K/W;

NOTE R_U (design values) may be determined with reference to EN ISO 10456 and/or EN ISO 6946 for air spaces.

NOTE For hygroscopic material made of hygroscopic material, evaluation of thermal characteristics and the rate of moisture must be assessment according to the EAD or product standards.

2.2.10 Durability of thermal resistance

Durability of the global thermal resistance (core resistance + air space resistance) taking into account the thermal resistance of air spaces shall be determined according to the standards EN 16012.

Thermal resistance taking into account the thermal resistance of air spaces may be affected by ageing of the low emissivity facing. The procedure for determination of emissivity given in EN 16012 already provides information on the potential ageing of the low emissivity surface.

2.2.11 Emissivity

Emissivity of the reflective surface or surfaces of the product shall be determined according to the standards EN 16012.

Measured values shall be determined by the manufacturer according to the following:

- measured value shall be expressed to 2 significant figures;
- emissivity value ϵ_D shall be given as a limit value representing at least 90 % of the production, determined with a confidence level of 90 %;

- statistical value of emissivity $\epsilon_{90/90}$ shall be assessed for each external face of the product if the two faces differ (including the presence of printing exceeding 5% of the area on any face), otherwise the emissivity value may be the mean value for the two faces provided they do not differ by more than 0,01;
- statistical value of emissivity shall be rounded upwards to the nearest 0,01. Values less than 0.05 shall be determined as 0.05.

Method of assessing

Emissivity of reflective surface or surfaces of the product shall be determined in accordance with the method given in EN 16012 (Clause 5.9 and Annex D) after conditioning in accordance with EN 16012 Clause D.5.3.

2.2.12 Water vapour diffusion resistance

Water vapour transmission properties shall be determined in accordance with EN ISO 12572 (using ‘wet’ conditions), and determined as the water vapour resistance, Z or the diffusion factor μ , All test results for Z or μ shall be within the tolerance range.

In the case of evaluation of a single layer of the reflective product (one membrane), water vapour transmission properties shall be determined in accordance with EN ISO 12572

The Z, μ or S_d value shall be stated in the ETA.

2.2.13 Water absorption

Water absorption is determined as following:

2.2.13.1. Short term water absorption

Short term water absorption by partial immersion, W_p , shall be determined in accordance with EN 1609 method A. No test result shall exceed 1,0 kg/m². By exception, products less than 50 mm thick shall be tested with only 5 mm of water depth and products less than 10 mm thickness shall be excluded from this requirement.

2.2.13.2. Long term water absorption

Long term water absorption by partial immersion, W_{lp} , shall be determined in accordance with EN 12087 method 1A. No test result shall exceed 3,0 kg/m².

2.2.14 Watertightness

If relevant, watertightness (or water penetration resistance) shall be determined where relevant in accordance with the method given in EN 13859-1, clause 5.2.3 and 5.2.4.

Where relevant, the value of W, for reflective insulation products shall be stated in the ETA according to the tolerances given in Table 2.

Table 2- Level and classes for “water tightness” tolerances

Level or class	Tolerances
W1	No water penetration
W2	Maximum 100 ml water passing through,
W3	More than 100 ml water passing through

Watertightness shall be determined accordance with the method given in EN 13859-1, clause 5.2.3 and 5.2.4.

2.2.15 Geometry

Length and width: Length, l, and width, b, shall be determined in accordance with EN 822.

Thickness: The determination of thickness, d, shall be carried out according to EN 16 012.

Method of assessing

Length and width:

Length, l, and width, b shall be stated in the ETA, no test result shall deviate from the nominal values by more than the following:

-2 + 5 % for length,

± 2.0 % for width.

Thickness:

Thickness, d, no test result shall deviate from the nominal thickness, d_N , by more than the following:

-2 + 5 % for thickness,

2.2.16 Apparent density / mass per unit area /

Apparent density / mass per unit area shall be stated in the ETA in accordance with EN 1602.

The apparent density / mass per unit area shall be determined in accordance with EN 1602. No individual result shall vary by more than 10% of the apparent density value.

2.2.17 Squareness

Squareness is determined as following:

Where relevant, squareness shall be stated in the ETA in accordance with EN 824.

Squareness shall be determined for a product supplied in boards or sheets with a length less than 5 m and shall be in accordance with EN 824.

The deviation from squareness on length and width, S_b , of boards and sheets shall not exceed 10 mm/m.

2.2.18 Compressive strength for products exposed to compression loads

Compressive stress is determined as following (for example: reflective rigid panel):

For applications in floor only.

- the compressive stress at 10% deformation, σ_{10} , or the compressive strength, σ_m , shall be determined according to EN 826.
- the test is carried out by using five specimens in (200 mm x 200 mm) or three specimens (300 mm x 300 mm).

Where relevant, the compressive stress or compressive strength shall be stated in the ETA in classes according to clause 4.3.3 of EN 13162.

2.2.19 Dimensional stability

The determination of the dimensional stability under specified temperature and humidity conditions shall be carried out, when relevant, according to EN 1604. The test shall be carried out after storage of 48 h at $(70 \pm 2)^\circ\text{C}$ and $(50 \pm 5)\%$ relative humidity.

The relative change of dimensions in length, $\Delta\epsilon_l$, width, $\Delta\epsilon_b$, and thickness, $\Delta\epsilon_d$, can be expressed in %.

2.2.20 Tensile strength parallel to faces

Tensile strength parallel to faces shall be stated in the ETA accordance with EN 1608.

For products which are not homogeneous tensile strength parallel to faces, it should be need to verify for direction in production flow and perpendicular to that.

Where relevant, tensile strength parallel to faces, σ_t , shall be determined in accordance with EN 1608.

2.2.21 Tensile strength perpendicular to faces

Tensile strength perpendicular to faces can be determined.

Tensile strength perpendicular to faces shall be determined in accordance with EN 1607.

Tensile strength perpendicular to faces shall be determined in accordance with EN 1607.

2.2.22 Resistance to tearing

The resistance to tearing (nail shank) shall be determined according to EN 12310-1, part 1. The test shall be carried before and after ageing (according EN 16012).

The resistance to tearing shall be determined according to EN 12310-1,

2.2.23 Peel Strength or mechanical resistance of adhesive tape

If relevant, adhesive tape is supplied with, or specified to be used with the reflective insulation product, the adhesion of the tape to the foil surface shall be tested using the method in EN ISO 11339. Where this property is relevant it shall be based on the adhesion of a 15 cm long strip of tape before and after ageing in accordance with the method in EN 16012 clause D.5.

Where relevant, the results obtained after ageing taking in account durability aspects shall be specified in the ETA.

2.2.24 Compressive creep for products exposed to compression loads

For applications in floor only, compressive creep, X_{ct} , and the total thickness reduction, X_t , shall be determined after at least 122 ± 1 days of testing at the compressive stress value, σ_c . The alternative stresses for the creep test, σ_c , shall be based an either the compressive strength, σ_{10} .

Where relevant, value of compressive creep, X_{ct} , the corresponding compressive stress σ_c shall be assessment according to EN 1606. The value of the total thickness reduction, X_t , shall be expressed according to Annex A of EN 1606.

2.2.25 Behaviour under point load for products exposed to compression loads

For applications in floor only:

The point load, F_p , at 5 % deformation shall be carried out according to EN 12430.

Where relevant, point load shall be expressed in levels with steps of 50 N.

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 system is: 3

In addition, with regard to reaction to fire the applicable European legal act is: Decision 2001/596/EC for products covered by this EAD.

The systems are: 1 or 3

3.2 Tasks of the manufacturer

The corner stones of the actions to be undertaken by the manufacturer of reflective product in the procedure of assessment and verification of constancy of performance are laid down in Table 3 and Table 4.

Table 3 : Control plan for the manufacturer; corner stones

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	Thermal core resistance	EN ISO 11925-2	See clause 2.2.9	Minimum 10 with a minimum of 4 from a notified laboratory	Once a week
	Emissivity	See clause 2.2.11	See clause 2.2.11	Minimum 10 with a minimum of 4 from a notified laboratory	Once a year
2	Length and width	See clause 2.2.15	See clause 2.2.15	See clause 2.2.2	Once per 4 h
3	Thickness	See clause 2.2.15	See clause 2.2.15	See clause 2.2.15	Once per 4 h
4	Squareness	See clause 2.2.17	See clause 2.2.17	See clause 2.2.17	Once a week
5	Mass per unit area / density	See clause 2.2.16	See clause 2.2.16	See clause 2.2.16	Once a day
6	Tensile strength parallel to faces	See clause 2.2.20	See clause 2.2.20	See clause 2.2.20	Once a week
7	Dimensional stability	See clause 2.2.19	See clause 2.2.19	1	Once a month
8	Water vapour diffusion resistance	See clause 2.2.12	See clause 2.2.12	See clause 2.2.12	Once a week
9	Reaction to fire of the product as placed on the market	EN ISO 11925-2	See clause 2.2.1	1	Once a week
		EN 13823 (for class D or higher)			Once a 2 years
10	Durability of thermal resistance (thickness)	See clause 2.2.10	See clause 2.2.10	See clause 2.2.10	Once a year
11	Air flow resistivity	See clause 2.2.4	See clause 2.2.4	See clause 2.2.4	Once a year
12	Short term water absorption	See clause 2.2.13	See clause 2.2.13	See clause 2.2.13	Once a year
13	Long term water absorption	See clause 2.2.13	See clause 2.2.13	See clause 2.2.13	Once a year
14	Resistance to tearing	See clause 2.2.22	See clause 2.2.22	See clause 2.2.22	Once a year
15	Sound absorption	See clause 2.2.8	See clause 2.2.8	See clause 2.2.8	Once a 5 years
17	Watertightness	See clause 2.2.14	See clause 2.2.14	See clause 2.2.14	Once a year

* In case of discontinuous production these minimum frequencies should be adapted to an equivalent frequency.

6.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance are laid down in Table 3.

Table 4 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 systems 1 only)</i>					
1	Reaction to fire**	Presence of suitable test equipment			Annually
		Presence of trained personnel			Annually
		Presence of an appropriate quality assurance system an necessary stipulations			Annually
Continuous surveillance, assessment and evaluation of factory production control <i>(for systems 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 the factory production control			Annually
		Issuing a report of surveillance			Annually

** Only relevant for products of class C and higher and if the manufacturer limits the organic content of the product or adds fire retardants.

7 REFERENCE DOCUMENTS

This EAD incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references subsequent amendments to or revisions of any of these 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 (including amendments).

EN 822	Thermal insulating products for building applications - Determination of length and width
EN 824	Thermal insulating products for building applications - Determination of squareness
EN 1602	Thermal insulating products for building applications - Determination of the apparent density
EN 1607	Thermal insulation products for building applications. Determination of tensile strength perpendicular to faces.
EN 1608	Thermal insulation products for building applications. Determination of tensile strength parallel to faces.
EN 1609	Thermal insulating products for building applications — Determination of short term water absorption by partial immersion
EN 16012	Thermal insulation for buildings—Reflective insulation products— Determination of the declared thermal performance.
EN 1931	Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties
EN ISO 12572	Hygrothermal performance of building materials and products — Determination of water vapour transmission properties
EN 11925-2	Reaction to fire tests – Ignitability of building products subjected to direct impingement of flame – Part 2: Single-flame source test
EN 12086	Thermal insulation products for building applications – Determination of water vapour transmission properties
EN 12087	Thermal insulating products for building applications — Determination of long term water absorption by immersion
EN 13501-1	Fire classification of construction products and building elements - Part 1: Classification using test data from fire 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 13171	Thermal insulation products for buildings – Factory made wood fibre (WF) products - Specification
EN 13172	Thermal insulation products for buildings – Factory made wood fibre (WF) products – Specification
EN 13501-1	Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests
EN 15715	Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing — Factory made products
EN 15101	Thermal insulation products for buildings — In-situ formed loose fill cellulose (LFCI) products — Part 1: Specification for the products before installation
ISO 9227	Corrosion tests in artificial atmospheres — Salt spray tests
EN 29053	Acoustics - Materials for acoustical applications - Determination of airflow resistance
EN 29052-1	Acoustics - Determination of dynamic stiffness - Part 1 : Materials used underfloating floors in dwellings
EN ISO 10140-1 to 5	Acoustics — Laboratory measurement of sound insulation of building elements — Part 1: Application rules for specific products
EN ISO 717-2	Acoustics — Rating of sound insulation in buildings and of building elements — Part 2: Impact sound insulation
EN 12431	Thermal insulating products for building applications — Determination of thickness for floating floor insulating products
EN ISO 354	Acoustics - Measurement of sound absorption in a reverberation room

- EN ISO 11654 Acoustics - Sound absorbers for use in buildings - Rating of sound absorption
- EN ISO 6946 Building components and building elements — Thermal resistance and thermal transmittance — Calculation method
- EN ISO 1182 Reaction to fire tests for products — Non-combustibility test
- EN ISO 1716 Reaction to fire tests for products — Non-combustibility test
- EN 13820 Thermal insulating materials for building applications — Determination of organic content
- EN 13823 Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item.
- EN ISO 11925-2 Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test
- EN ISO 11339 T-peel test for the determination of the peel strength of an adhesive by measuring the peeling force of a T- shaped bonded assembly of two flexible adherends.

Annex A : METHOD OF ASSESSING FOR REACTION TO FIRE: mounting and fixing procedure for SBI testing

Note: if products are already covered by a harmonised standard or an ETA, then the mounting and fixing provisions of that harmonised standard or ETA apply.

1. TERMINOLOGY

Extended application:

The outcome of a process (involving the application of defined rules that may incorporate calculation procedures) that predicts, for a variation of a product property and/or its intended use application(s), a test result on the basis of one or more tests to the same test standard.

2. MOUNTING AND FIXING IN ACCORDANCE WITH EN 13823

2.1. Dimensions of the test rig

The test rig consists of a corner with a long (1,0 m) and a short (0,5 m) wing. The long wing consists of 2 modules, with at least one vertical and/or one horizontal product to product joint in the long wing. All products shall be tested vertically.

The dimensions of the test specimens, in the case of a vertical joint shall be:

	Assembly dimensions (mm – nominally)	
	Length	Height
Short wing	495	1500
Long wing	200 + t	1500
	800 - t	1500
Where t = thickness of the assembly		

2.2. Test specimen

The reflective product shall be mounted and fixed according to EN 13823

The test specimen shall fully represent the end use conditions using all the envisaged components in the end use condition as specified by the applicant. The assembly including corner and joint details shall be as specified by the applicant and in accordance the end use conditions

The type and dimensions of materials and products used, the dimensions and location of possible fixings etc shall be recorded in the test report

2.3. Mounting and fixing of the test assembly

When testing to EN 13823 the test assembly shall be representative of end use conditions. As reflective products are intended to create non ventilated spaces, the mounting shall always incorporate air gaps which shall not be ventilated according to their end-use. Under end use conditions, a number of different substrates may be found, the most common of which are plasterboard, concrete and wood (of several different types) These substrates are defined in EN 13238.

Therefore the mounting and fixing of the reflective product needs to take these rules into consideration and the test specimen shall contain an airgap between itself and the chosen substrate which itself is placed against the backing board. The airgaps shall be built using wooden or metallic battens. The wooden battens also validate the metallic battens. The minimum distance between the substrate and the product shall be 40 mm. The choice of the substrate and the airgap distance is for the manufacturer and the Notified Body (should the product be system 1) to agree, however this will have a direct bearing on the end use application of the product.

The type of fixing (mechanical or adhesive) shall be defined and shall represent end-use conditions. In the case where an adhesive is used, the nature and the quantity of adhesive have to be defined.

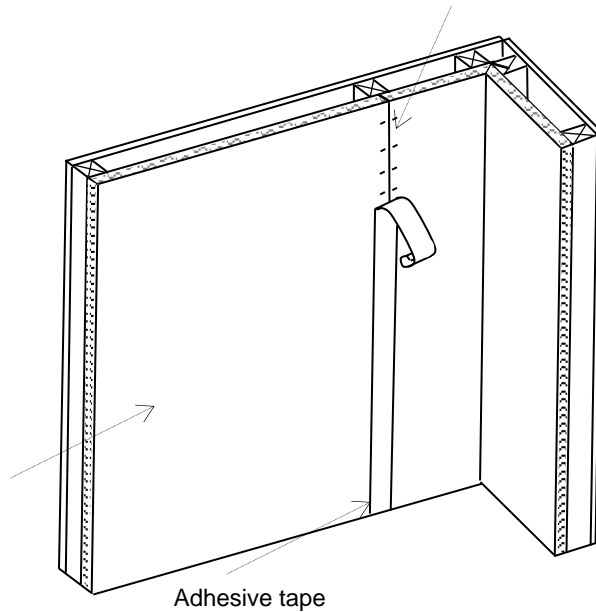


Figure 1: Example of mounting arrangement in EN 13823 with a vertical joint

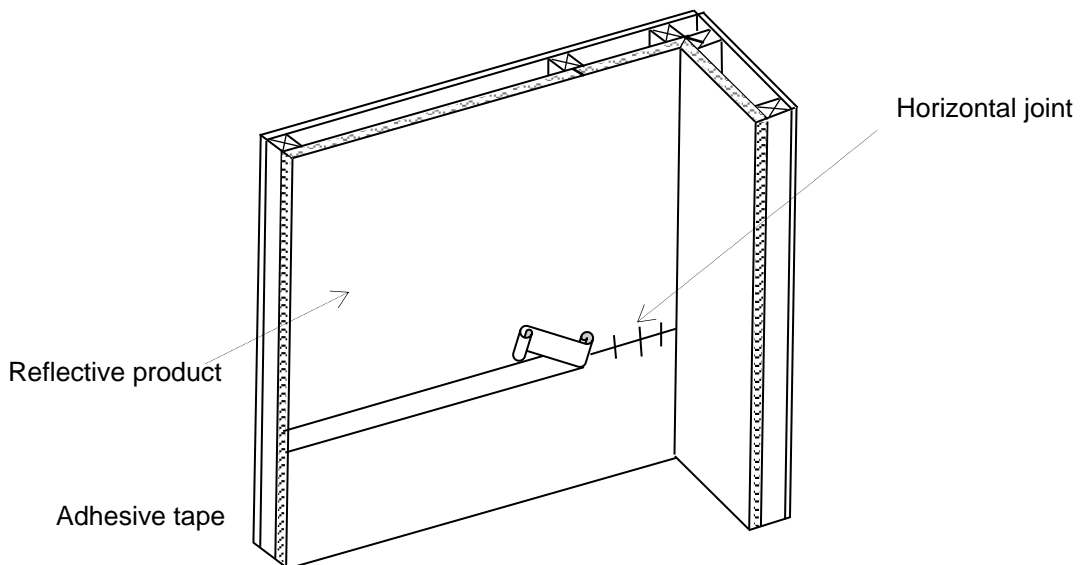


Figure 2 : Example of mounting arrangement in EN 13823 with a horizontal joint

2.4. Horizontal / vertical joint

The manner in which the product is tested has a direct consequence upon the manner in which the product or product family may be classified and used within a building construction. When determining the testing programme all aspects of the product in terms of its own parameters and its end-use parameters need to be considered. For this construction product, the following provides guidance on the potential end-use application rules which may apply dependant on the testing programme undertaken.

3. END USE APPLICATION RULES

The manner in which the product is tested has a direct consequence upon the manner in which the product or product family may be classified and used within a building construction. When determining the testing programme all aspects of the product in terms of its own parameters and its end-use parameters need to be considered. For this construction product, the following provides guidance on the potential end-use application rules which may apply dependant on the testing programme undertaken.

3.1. Influence of air gap

The distance (X mm) between the reflective product and the substrate used in the EN 13823 test provides the minimum distance from the end use substrate at which the membrane may be placed in end use. The end use application stated in the classification report will be:

The reflective product be placed Xmm or greater in front of any substrate.

In special cases where the test is conducted without any airgap (the product is tested by placing it directly onto the substrate), then the test result is only valid for the same product used without an airgap.

3.2. Influence of substrate

The substrate used behind the reflective product in the EN 13823 determines the type of end use substrate below which the reflective product can be used.

The standard substrates and the corresponding extended application rules are defined in EN 13238.

3.3. Influence of colour

If the tests conducted on the darkest, lightest and mid-range colours yield the same classification* that classification will apply to all colours provided the value of each fire test parameter achieved is at least 10% less than the criteria for that classification.

3.4. Influence of the density of the core

For on type of facing, if the tests conducted on the core with the minimum density and the maximum density yield the same classification*, the classification will apply for the intermediate densities.

3.5. Influence of the thickness and/or number of layers

If the test conducted on the minimum 'thickness and/or number of layers' and the test conducted on the maximum 'thickness and/or number of layers' yield the same classification*, the classification will apply for the intermediate thicknesses and/or numbers of layers. This rule is valid when all the layers are identical.

This rule applies for the core of the product and also for the facings.

3.6. Influence of other variables

Other variable parameters such as organic content, type of coating ...etc may be addressed in a similar manner to the above.

Note: If different classifications are obtained, additional testing shall be conducted to redefine the product family to which a single classification applies.