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Trade name of the construction product

Designação comercial do produto de construção

Product family to which the construction product belongs

Família de produtos a que o produto de construção pertence

Manufacturer

Fabricante

Manufacturing plant(s)

Instalações de fabrico

This European Technical Assessment contains

A presente Avaliação Técnica Europeia contém

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This European Technical Assessment

A presente Avaliação Técnica Europeia

CIN-k EPS Classic

External Thermal Insulation Composite System with rendering on expanded polystyrene for use as external insulation of building walls

Sistema Compósito de Isolamento Térmico pelo Exterior com revestimento aplicado sobre isolante térmico de poliestireno expandido moldado destinado ao isolamento exterior de paredes de edifícios

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15 pages, including 2 annexes which form an integral part of this assessment

15 páginas, incluindo 2 anexos que fazem parte desta avaliação

European Assessment Document - EAD 040083-00-0404: External thermal insulation composite systems (ETICS) with renderings, January 2019

Documento de Avaliação Europeia - EAD 040083-00-0404: Sistemas compósitos de isolamento térmico exterior com revestimento aplicado sobre isolante (ETICS), janeiro de 2019

Replaces ETA 16/0294, issued on 16/02/2018

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1. Technical description of the product

The External Thermal Insulation Composite System (from now on, referred to as ETICS) *CIN-k EPS Classic* is designed and installed in accordance with the manufacturer's design and installation instructions, deposited with LNEC¹.

CIN-k EPS Classic is a bonded system with supplementary mechanical fixings used primarily to provide stability until the adhesive has dried and increase the adherence of the system reducing the risk of detachment.

The ETICS comprises the components identified in Table 1, which are factory produced by manufacturer or by a supplier.

It is made up on site from these components. The manufacturer is ultimately responsible for the ETICS.

2. Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

This ETICS is intended to be used as external thermal insulation for building walls. The walls are made of masonry (bricks or blocks) or concrete (cast on site or as prefabricated panels) with a reaction to fire classification A1 to A2-s2,d0 according to EN 13501-1 or A1 according to the EC decision 96/603/EC as amended. The ETICS is designed to give the wall to which is applied satisfactory thermal insulation.

The ETICS is made of non load-bearing construction elements. It does not contribute directly to the stability of the wall on which is installed, but it can contribute to its durability by providing enhanced protection from the effect of weathering. The thermal resistance of the ETICS shall be $\geq 1,0 \text{ m}^2 \text{ K/W}$.

This ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is not intended to ensure the air tightness of the building structure.

Design and installation of ETICS should take into account the principles laid down EAD 040083-00-0404 (see 1.1) and shall be done in accordance with national instructions. This ETA covers the application of bonded ETICS where the concrete for testing of bond strength is representative for masonry or concrete. For bonded applications onto other substrates (e.g. organic paints or ceramic tiles), testing on the job site is necessary.

The provisions made in this ETA are based on an assumed working life of at least 25 years, provided that the conditions laid down for the installation, appropriate use, maintenance and repair are met.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

Installation

The ETICS is installed on site. It is the responsibility of the manufacturer to guarantee that the information about design and installation of this ETICS is effectively communicated to the concerned people. This information can be given using reproductions of the respective parts of this European Technical Assessment. Besides, all the data concerning the execution shall be clearly indicated on the packaging and/or the enclosed instruction sheets using one or several illustrations.

The wall on which the ETICS is applied shall be sufficiently stable and airtight. Its stiffness shall be big enough to ensure that the ETICS is not subjected to deformations, which could lead to damage. The requirements given in EAD 040083-00-0404 (see 1.3.1) have to be considered.

Design

The user shall comply with the national regulations particularly concerning fire and wind load resistance. Only the components described in clause 1 with characteristics according to clause 3 of this ETA can be used for this ETICS.

The works including the details (such as connections and joints) shall be designed in order to avoid water penetration behind the system. To bond the ETICS, the minimum surface area and the method of bonding shall comply with the characteristics of the ETICS (see 3.2.4 of this ETA) as well as the national regulations. In any case, the minimum bonded surface shall be at least 20%.

¹ The technical documentation of this European Technical Assessment is deposited with Laboratório Nacional de Engenharia Civil (LNEC) and, as far as relevant for the tasks of the notified body (bodies) involved in the assessment and verification of constancy of performance procedure, is handed over to the notified body (bodies).

TABLE 1
Definition of the components

| Components | Trade name | Description ¹ | Coverage (kg/m ²) | Thickness (mm) | |
|--|----------------------------|---|--|--|------------|
| Insulation product | POLIESTIRENO EXPANDIDO 100 | Expanded polystyrene (EPS) Panels with 1000 mm x 500 mm and bulk density of 21 kg/m ³ , with CE marking | – | 40 to 60 | |
| Adhesive | PRINCOL ARGAMASSA FIBRADA | Mortar based on cement, synthetic resins and mineral additives | 3 to 3.5 | – | |
| Base coat | PRINCOL ARGAMASSA FIBRADA | Mortar based on cement, synthetic resins and mineral additives | with standard glass fibre | 4 to 5 (including regularization coat) | 1.5 to 3.5 |
| | | | with reinforced glass fibre | 7.5 to 9 (including regularization coat) | 3.5 to 5.5 |
| Finishing coats | F1a | PRIMÁRIO TEXTURADO | Textured watery dispersion key coat | 0.15 to 0.20 | 0.5 to 1 |
| | | CARSO 1 ² | Synthetic thin render based on a watery dispersion co-polymer, marble particles with selected grain sizes and pigments | 2 to 2.5 | |
| | F1b | PRIMÁRIO TEXTURADO | Textured watery dispersion key coat | 0.15 to 0.20 | 0.5 to 1 |
| | | ERALIT ² | Synthetic thin render based on a watery dispersion co-polymer, marble particles with selected grain sizes and pigments | 2 to 2.5 | |
| | F2a | ARGAMASSA AREADA | Dry mortar with grainy finishing | 1.4 to 1.7 | 0.9 to 1 |
| | | PRIMÁRIO CINOLITE HP ³ | Watery dispersion white key coat | 0.2 to 0.3 | |
| | | NOVATEX HD | Acrylic paint forming a sandy film, reinforced with quartz | 0.7 to 0.9 | |
| | | ARGAMASSA AREADA | Dry mortar with grainy finishing | 1.4 to 1.7 | |
| F2b | PROFIX HP ³ | Watery dispersion white key coat | 0.2 to 0.3 | 0.9 to 1 | |
| | NOVATEX HD | Acrylic paint forming a sandy film, reinforced with quartz | 0.7 to 0.9 | | |
| Glass fibre meshes | FAST TELA F167 | Standard mesh, glass fibre mesh with mesh size 5 mm x 4 mm (in accordance with Agrément Certificate DH 942 by LNEC) | – | – | |
| | FAST TELA F300 | Reinforced mesh, glass fibre mesh with mesh size 6 mm x 6 mm (in accordance with Agrément Certificate DH 942 by LNEC) | – | – | |
| Anchors (supplementary mechanical fixings) | PREGO DE FIXAÇÃO TDS 8 | Description in accordance with ETA 04/0030 ⁴ Remain under the manufacturer responsibility | – | – | |
| Ancillary materials | | Description in accordance with clause 1.3.13 of EAD 040083-00-0404 Remain under the manufacturer responsibility | | | |

¹ See clause 3.2 for further description, characteristics and performances of components.

² CARSO 1 and ERALIT are similar materials, only differentiated by the size of the aggregates, so the tests were performed only for one of them (CARSO 1).

³ PRIMÁRIO CINOLITE HP and PROFIX HP are identical materials, so the tests were only performed for one of the products (PRIMÁRIO CINOLITE HP).

⁴ ETA based on ETAG 014, used as EAD.

Execution

The recognition and preparation of the substrate as well as the generalities about the execution of the ETICS shall be carried out in compliance with the manufacturer prescriptions and the corresponding national regulations.

The particularities in execution linked to the method of bonding and the application of the rendering system shall be handled in accordance with the manufacturer's prescriptions. In particular, it is suitable to comply with the quantities of rendering applied, the thickness regularity and the drying periods between layers.

Use, maintenance and repair of the works

It is accepted that the finishing coats shall normally be maintained in order to fully preserve the system's performance. Maintenance will include at least:

- the repair of localized damaged areas due to accidents;
- the application of various products or paints, possibly after washing or surface preparation.

Necessary repairs should be done rapidly. It is important to be able to carry out maintenance as far as possible using readily available products and equipment, without spoiling appearance.

3. Performance of the product and references to the methods used for its assessment

3.1 General

The identification tests and the assessment for the intended use of this ETICS according to the Basic Requirements were carried out in compliance with EAD 040083-00-0404.

3.2 ETICS characteristics

3.2.1 Mechanical resistance and stability (BWR 1)

Not relevant.

3.2.2 Safety in case of fire (BWR 2)

a) Reaction to fire (EAD 040083-00-0404 – clause 2.2.1.1)

The reaction to fire was tested according to EN 13823 and EN 11925-2 and classified according to EN 13501-1+A1.

The ETICS meets the requirements of class B-s1,d0 with finishing coats F1a (PRIMÁRIO TEXTURADO + CARSO 1) and C-s1,d0 with F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) and F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD), according to EN 13501-1+A1.

3.2.3 Hygiene, health and environment (BWR 3)

a) Water absorption (EAD 040083-00-0404 – clause 2.2.5.1)

The results of the water absorption test of the base coat (system with and without finishing), presented in Table 2, verify the following condition:

- water absorption after 1 hour < 1 kg/m²

The system is therefore judged to have satisfactory performance concerning water absorption, independently of the finishing coat.

b) Hygrothermal behaviour (EAD 040083-00-0404 – clause 2.2.6)

The ETICS has been assessed on a rig.

During heat-rain and heat-cold cycles, none of the following defects occurs during testing:

- blistering or peeling of the finishing coat, base coat or rendering system;
- failure or cracking associated with joints between insulation product boards or profiles fitted with the system;
- detachment of finishing coat, base coat or rendering system;
- cracking allowing water penetration to the insulation layer.

The ETICS is therefore assessed as resistant to hygrothermal cycles.

c) Freeze / thaw behaviour (EAD 040083-00-0404 – clause 2.2.7)

The water absorption of the system configurations composed by the base coat and the finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) and by the base coat and the finishing coats F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) and F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) was in all cases less than 0.5 kg/m² after 24 hours.

Therefore the classification concerning freeze-thaw resistance is the following:

- configuration “EPS + base coat + standard mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1)” – no test, but freeze-thaw resistant according to the capillarity test result;
- configuration “EPS + base coat + standard mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD)” – no test, but freeze-thaw resistant according to the capillarity test result;
- configuration “EPS + base coat + standard mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP+ NOVATEX HD)” – no test, but freeze-thaw resistant according to the capillarity test result;
- any other configuration – performance not assessed.

TABLE 2
Water absorption (capillarity test)

| System specimens | Water absorption after 1 h (kg/m ²) | Water absorption after 24 h (kg/m ²) |
|---|---|--|
| EPS + base coat + standard mesh | Min.: 0.15 Average: 0.16 | Min.: 0.23 Average: 0.24 |
| EPS + base coat + standard mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | Min.: 0.07 Average: 0.09 | Min.: 0.42 Average: 0.44 |
| EPS + base coat + standard mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | Min.: 0.02 Average: 0.05 | Min.: 0.12 Average: 0.16 |
| EPS + base coat + standard mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | Min.: 0.02 Average: 0.05 | Min.: 0.12 Average: 0.16 |

d) Impact resistance (EAD 040083-00-0404 – clause 2.2.8)

The resistance to hard body impact (3 and 10 Joules) tests carried out on samples of systems compositions lead to the use categories presented in Table 3.

TABLE 3
Impact resistance to hard body impacts

| System | Impact | Impact diameter (mm) | Presence of cracks | Use categories ¹ |
|---|--------|-------------------------|-----------------------------|-----------------------------|
| EPS + base coat + standard mesh | 3 J | Min.: 23 Average: 31 | Cracking and no penetration | III |
| | 10 J | Min.: 55 Average: 58 | Cracking and no penetration | |
| EPS + base coat + standard mesh + reinforced mesh | 3 J | Min.: 15 Average: 19 | No cracking | II |
| | 10 J | Min.: 28 Average: 37 | Cracking and no penetration | |
| EPS + base coat + standard mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | 3 J | Min.: 17 Average: 19 | No cracking | II |
| | 10 J | Min.: 30 Average: 42 | Cracking and no penetration | |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | 3 J | Min.: 15 Average: 17 | No cracking | I |
| | 10 J | Min.: 29 Average: 31 | No cracking | |
| EPS + base coat + standard mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | 3 J | Min.: 22 Average: 24 | Cracking and no penetration | III |
| | 10 J | Min.: 54 Average: 75 | Cracking and no penetration | |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | 3 J | Min.: 17 Average: 18 | Cracking and no penetration | III |
| | 10 J | Min.: 25 Average: 26 | Cracking and no penetration | |
| EPS + base coat + standard mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | 3 J | Min.: 22 Average: 24 | Cracking and no penetration | III |
| | 10 J | Min.: 54 Average: 75 | Cracking and no penetration | |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | 3 J | Min.: 17 Average: 18 | Cracking and no penetration | III |
| | 10 J | Min.: 25 Average: 26 | Cracking and no penetration | |

¹ Use categories:

Category I – zones readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use;
 Category II – zones liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care;
 Category III – zones not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

e) Water vapour permeability (EAD 040083-00-0404 – clause 2.2.9.1)

Table 4 presents the resistance to water vapour diffusion of the rendering system (base coat and finishing coat) for the several system configurations, expressed by the equivalent air thickness. In all cases, values don't exceed 2.0 m.

TABLE 4
Equivalent air thickness

| System specimens | Equivalent air thickness (m) |
|---|------------------------------|
| Base coat + standard mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | 0.7 |
| Base coat + standard mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | 0.8 |
| Base coat + standard mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | 0.8 |

f) Dangerous substances

This system complies with the provisions of Guidance Paper H². A declaration of conformity in this respect was made by the manufacturer. In addition to the specific clauses relating to dangerous substances contained in this ETA, there may be other requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of Regulation (EU) No. 305/11, these requirements need also to be complied with, when and where apply.

3.2.4 Safety on use (BWR 4)

a) Bond strength

– Base coat onto EPS board (EAD 040083-00-0404 – clause 2.2.11.1)

Tests were performed on the system applied on the rig, after hygrothermal cycles. The results are summarized in Table 5.

In all cases, bond strength values are higher than 80 kPa and the failure occurred preferentially in the insulation board (cohesion failure).

TABLE 5
Bond strength between base coat and insulation product

| System (rig) ¹ | Bond strength (after ageing) (kPa / Failure pattern) ² |
|---|---|
| EPS + base coat + standard mesh | Min.: 160 Average: 170 FP: C/A |
| EPS + base coat + standard mesh + reinforced mesh | Min.: 130 Average: 150 / FP: C |
| EPS + base coat + standard mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | Min.: 130 / Average: 150 / FP: C |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F1a (PRIMÁRIO TEXTURADO + CARSO 1) | Min.: 210 Average: 210 / FP: C |
| EPS + base coat + standard mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | Min.: 180 Average: 200 / FP: C/B |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F2a (ARGAMASSA AREADA + PRIMÁRIO CINOLITE HP + NOVATEX HD) | Min.: 180 Average: 210 / FP: C |
| EPS + base coat + standard mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | Min.: 180 Average: 200 / FP: C/B |
| EPS + base coat + standard mesh + reinforced mesh + finishing coat F2b (ARGAMASSA AREADA + PROFIX HP + NOVATEX HD) | Min.: 180 Average: 210 / FP: C |

¹ Rig – system applied on brick masonry with tested dimensions of 3 m × 2 m. The system was subjected to hygrothermal cycles before the adhesion tests.

² Failure pattern: FP:A – adhesion failure (failure between adhesive and insulation product), FP:B – cohesion failure (failure in the adhesive) and FP:C – cohesion failure (failure in the insulation product).

² Guidance Document H, A harmonized approach related to dangerous substances under the Construction Products Directive.

– Adhesive onto EPS board (EAD 040083-00-0404 – clause 2.2.11.3)

Tests were performed on samples of EPS insulation boards faced with adhesive. The results are summarized in Table 6. In all cases, the results are within the limits defined by EAD 040083-00-0404.

TABLE 6
Bond strength between adhesive and insulation product

| Specimen | Bond strength (kPa / Failure pattern) ¹ | | |
|----------------|--|--|---|
| | Initial state | After conditioning | |
| | | 48 h immersion in water + 2 h 23 °C/50% RH | 48 h immersion in water + 7 days 23 °C/50% RH |
| EPS + adhesive | Min.: 180 Average: 190 FP:C | Min.: 80 Average: 100 FP:C/A | Min.: 230 Average: 230 FP:C |

¹ Failure pattern: FP:A – adhesion failure (failure between adhesive and insulation product) and FP:C – cohesion failure (failure in the insulation product).

– Adhesive onto concrete (EAD 040083-00-0404 – clause 2.2.11.2)

Tests were performed on samples of concrete boards faced with adhesive product. The results are summarized in Table 7. In all cases, the results are within the limits defined by EAD 040083-00-0404.

TABLE 7
Bond strength between adhesive and substrate (concrete)

| Specimen | Bond strength (kPa / Failure pattern) ¹ | | |
|---------------------------------|--|---|--|
| | Initial state | After conditioning | |
| | | 48 h immersion in water + 2 h 23 °C/ 50% RH | 48 h immersion in water + 7 days 23 °C/ 50% RH |
| Adhesive + substrate (concrete) | Min.: 960 Average: 1640 FP:B/A | Min.: 550 Average: 740 FP:B/A | Min.: 340 Average: 1490 FP:B/A |

¹ Failure pattern: FP:A – adhesion failure (failure between adhesive and substrate) and FP:B – cohesion failure (failure in the adhesive).

The minimal bonded surface S is calculated as follows, with a minimum of 20%:

$$S (\%) = [30 \times 100] / B$$

where:

B minimum mean failure resistance of the adhesive to the insulation product in dry conditions expressed in kPa (180 kPa);
30 kPa corresponds to the minimum requirement.

The minimum bonded surface S calculated is therefore 17%.

The bonding surface of 20% verifies the minimum requirement.

b) Wind load resistance (EAD 040083-00-0404 – clause 2.2.13)

No performance concerning the wind load resistance has been investigated.

3.2.5 Protection against noise (BWR 5)

No performance concerning the protection against noise has been investigated (EAD 040083-00-0404 – clause 2.2.22.1).

3.2.6 Energy economy and heat retention (BWR 6)

a) Thermal resistance (EAD 040083-00-0404 – clause 2.2.23)

The additional thermal resistance R_{ETICS} provided by the ETICS to the substrate wall is calculated in accordance with EN ISO 6946 from the nominal value of the insulation product's thermal resistance R_D given accompanied to the CE marking and from the thermal resistance of the rendering system R_{render} which is about 0.02 m².K/W:

$$R_{ETICS} = R_D + R_{render}$$

Thermal bridges caused by mechanical fixing devices influence the thermal transmittance of the entire wall and shall be taken into account.

The corrected thermal transmittance of the entire wall including ETICS and thermal bridges is calculated using the following expression:

$$U_c = U + \chi_p \cdot n$$

where:

U_c corrected thermal transmittance of the entire wall including ETICS and thermal bridges (W/(m².K));

U thermal transmittance of the entire wall including ETICS without thermal bridges (W/(m².K));

n number of anchors (through insulation product) per m²;

χ_p point thermal transmittance value of an anchor (W/K). See EOTA Technical Report TR 025. If not specified in the anchor's ETA, the following values apply:

= 0.002 W/K for anchors with a stainless steel screw with the head covered by plastic material and for anchors with an air gap at the head of the screw ($\chi_p \cdot n$ negligible for $n < 20$);

= negligible for anchors with plastic nails (reinforced or not with glass fibres).

The term $\chi_p \cdot n$ has only to be taken into account if it is greater than 0.04 W/(m².K).

The thermal transmittance of the entire wall including ETICS without thermal bridges is determined as follows:

$$U = 1 / (R_i + R_{\text{render}} + R_{\text{substrate}} + R_{\text{se}} + R_{\text{si}})$$

where:

R_i thermal resistance of the insulation product (see CE marking in reference to EPS EN 13163) in m².K/W;

R_{render} thermal resistance of the render (about 0.02 m².K/W);

$R_{\text{substrate}}$ thermal resistance of the substrate (concrete, brick,...) in m².K/W;

R_{se} external surface resistance in m².K/W;

R_{si} internal surface resistance in m².K/W.

3.2.7 Sustainable use of natural resources (BWR 7)

Performance not assessed.

3.2.8 Aspects of durability and serviceability

a) Bond strength after ageing

Results of the tests for determining the bond strength between the base coat and the insulation product presented in Table 5 show that in all cases they are higher than 80 kPa.

3.3 Component characteristics

3.3.1 General

Detailed information on the chemical composition and other identifying characteristics of the components, following EAD 040083-00-0404, has been deposited with LNEC.

Further information can be observed from the product data sheets, which are part of the Technical Documentation for this ETA.

3.3.2 Insulation product

Factory-prefabricated boards, made of expanded polystyrene (EPS), having the description, characteristics and performance (as minimum) defined in Table 8 (EN 13163).

3.3.3 Render

– Render strip tensile resistance (EAD 040083-00-0404 – clause 2.2.17)

Fatigue tests were performed on specimens to determine the rupture stress of the reinforced render. The results are presented in Table 9.

TABLE 8
Characteristics of insulation panels

| Component | Trade name | Characteristics | Declared values and classes | |
|---|---|---|---|----------------------------------|
| Insulation product | POLIESTIRENO EXPANDIDO 100 | Reaction to fire (EN 13501-1+A1) | Euroclass E (EAD 040083-00-0404 – clause 2.2.1.2) Density (EN 1602): $21 \pm 1 \text{ kg/m}^3$ Thickness: 40 to 60 mm | |
| | | Thermal conductivity | 0.036 (W/m.K) | |
| | | Classes of dimensional tolerances (EN 13163) | Thickness | Class T(1): $\pm 1 \text{ mm}$ |
| | | | Length | Class L(2): $\pm 2 \text{ mm}$ |
| | | | Width | Class W(1): $\pm 1 \text{ mm}$ |
| | | | Squareness | Class S(1): $\pm 1 \text{ mm/m}$ |
| | | | Flatness | Class P(3): $\pm 3 \text{ mm}$ |
| | | Compressive strength (EN 13163) | 110 kPa | |
| | | Flexural strength (EN 13163) | 150 kPa | |
| | | Dimensional stability under laboratory condition (EN 13163) | $\leq 1.0 \%$ | |
| | | Water absorption (partial immersion) (EN 1609) | $0.04 \pm 0.01 \text{ kg/m}^2$ | |
| | | Water vapour diffusion resistance factor (EN 12086) | 39 ± 3 | |
| Tensile strength perpendicular to the faces (EN 1607) | $242 \pm 10 \text{ kPa}$ | | | |
| Shear strength and shear modulus of elasticity (EN 12090) | Shear strength: $130 \pm 10 \text{ kPa}$ Shear modulus of elasticity: $2300 \pm 100 \text{ kPa}$ | | | |

TABLE 9
Results of render strip tensile test

| System specimen | Characteristics | Test results |
|---------------------------|---|--------------|
| Base coat + standard mesh | Tensile strength (N/mm) | 23 |
| | Tensile strength while the first crack is formed (N/mm) | 12 |
| | Crack width at relative elongation (mm) | 0.04 |

3.3.4 Glass fibre meshes

The characteristics of the glass fibre meshes are presented in Table 10 (EAD 040083-00-0404 – clause 2.2.21).

3.3.5 Anchors

Anchors for expanded polystyrene panels act as supplementary fixing if required. They are covered by ETA 04/0030, according to ETAG 014, used as EAD (see Table 1).

Their main characteristics and design data are presented in Table 11.

TABLE 10
Results of meshes tensile test

| Component | Trade name | Characteristics | Test results |
|-----------------|----------------|--|----------------------------|
| Standard mesh | FAST TELA F167 | Tensile strength after accelerated artificial ageing (N/mm) | 20 (≥ 20) |
| | | Relative residual resistance: % (after ageing) of the strength in the as delivered state | 61 (> 50) |
| | | Mass per surface unit (g/m^2) | 160 ($\pm 5\%$) |
| | | Mesh dimensions (mm \times mm) | 5 \times 4 ($\pm 5\%$) |
| Reinforced mesh | FAST TELA F300 | Tensile strength after accelerated artificial ageing (N/mm) | 38 (> 20) |
| | | Relative residual resistance: % (after ageing) of the strength in the as delivered state | 67 (> 50) |
| | | Mass per surface unit (g/m^2) | 330 ($\pm 5\%$) |
| | | Mesh dimensions (mm \times mm) | 6 \times 6 ($\pm 5\%$) |

TABLE 11
Description and characteristics of anchors

| Component | Trade name | Characteristics | Declared values and design data |
|-----------|------------------------|----------------------------------|---|
| Anchors | PREGO DE FIXAÇÃO TDS 8 | Anchor type | See dimensional characteristics in Table 2 of Annex 3 of ETA 04/0030 |
| | | Materials | Anchor (expansion sleeve): polypropylene Nail: galvanized and inoxidable steel |
| | | Resistance to tension loads (kN) | 0.3 – 0.8 (see ETA 04/0030) |
| | | Spacing (mm) | ≥ 100 |
| | | Edge distance (mm) | ≥ 100 |
| | | Thickness of the substrate (mm) | ≥ 100 |

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 97/556/EC of the European Commission of 14 July 1997³, as amended by the decision 2001/596/EC⁴ of 8 January of 2001, and considering the classes B and C for the reaction to fire of the ETICS and that no stage in the production process has been identified that could result in an improvement of the reaction to fire characteristic, the system of assessment and verification of constancy of performance (see Annex V, as amended by Commission Delegated Regulation no. 568/2014 of 18 February 2014, and article 65, paragraph 2 of Regulation (EU) No. 305/2011) given in Table 12 applies.

TABLE 12
System of assessment and verification of constancy of performance

| Product | Intended uses | Levels or classes | System |
|-------------------|---|-------------------|--------|
| CIN-k EPS Classic | External thermal insulation composite system with rendering for use on building walls | Any | 2+ |

³ Official Journal of the European Communities L229/14 of 20.08.1997.

⁴ Official Journal of the European Communities L229/33 of 02.08.2001.

This system of assessment and verification of constancy of performance +2 is defined as follows:

System 2+: Declaration of the performance of the essential characteristics of the construction product by the manufacturer on the basis of:

- a) Tasks for the manufacturer:
 - (1) factory production control;
 - (2) testing of samples taken at the factory in accordance with the prescribed test plan.
- b) Tasks for the notified factory production control certification body:
 - (3) decision on the issuing, restriction, suspension or withdrawal of the certificate of conformity of the factory production control on the basis of the outcome of the following assessments and verifications carried out by that body:
 - initial inspection of the manufacturing plant and of factory production control;
 - continuous surveillance, assessment and evaluation of factory production control.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

5.1 General

The ETA is issued on the basis of agreed data/information, deposited with LNEC, which identifies the product that has been assessed and judged. It is the manufacturer's responsibility to make sure that all those who use the kit are appropriately informed of the specific conditions laid down in this ETA, including its annexes.

5.2 Tasks for the manufacturer

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed.

This production control system shall ensure that the product is in conformity with this ETA.

The manufacturer may only use components stated in the technical documentation of this ETA. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

For the components of the ETICS which the manufacturer does not manufacture by himself, he shall make sure that the factory production control carried out by the other manufacturers gives the guarantee of the components compliance with the ETA.

The factory production control shall be in accordance with the Control Plan⁵, which is part of the Technical Documentation of this ETA. The control plan has been agreed between the manufacturer and the LNEC and is laid down in the context of the factory production control system operated by the manufacturer and deposited within LNEC. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body (bodies) which is (are) notified for the tasks referred to in section 4 in the field of ETICS in order to undertake the actions laid down in this clause. For this purpose, the Control Plan shall be handed over by the manufacturer to the notified body (bodies) involved.

For assessing the ETICS and the components the results of the tests performed as part of the assessment for the ETA shall be used unless there are changes in the production line or plant. In such cases the necessary testing has to be agreed with LNEC.

The declaration of performance of the ETICS to be drawn up by the manufacturer following the issuing of this ETA shall include its reference number and issuing date.

Changes to the ETICS or the components or their production process should be notified to LNEC before the changes are introduced. LNEC will decide whether or not such changes affect the ETA and, if so, whether further assessment or alterations to the ETA shall be necessary.

⁵ The Control Plan is a confidential part of this European Technical Assessment and is only handed over to the notified body or bodies involved in the procedure of assessment and verification of constancy of performance. See section 5.3.

5.3 Tasks for the notified body (bodies)

Within the scope of the initial inspection of factory and of factory production control, the notified body (bodies) shall ascertain that, in accordance with the Control Plan, the factory (in particular the employees and the equipment) and the factory production control are suitable to ensure continuous and orderly manufacturing of the components according to the specifications mentioned in this ETA.

Within the scope of continuous surveillance, assessment and evaluation of factory production control, the notified body (bodies) shall visit the factory at least once a year for surveillance. It has to be verified that the factory production control is maintained in suitable conditions.

These tasks shall be performed in accordance with the provisions laid down in the Control Plan.

The notified body (bodies) shall retain the essential points of its (their) actions referred to above and state the results obtained and conclusions drawn in a written report.

The notified body involved by the manufacturer shall issue a certificate of conformity of the factory production control stating the conformity with the provisions of this ETA.

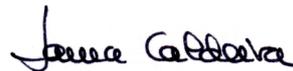
In cases where the provisions of the ETA and its Control Plan are no longer fulfilled, the notified certification body shall withdraw the certificate of conformity and inform LNEC without delay.

Issued in Lisbon on 30/12/2021

By

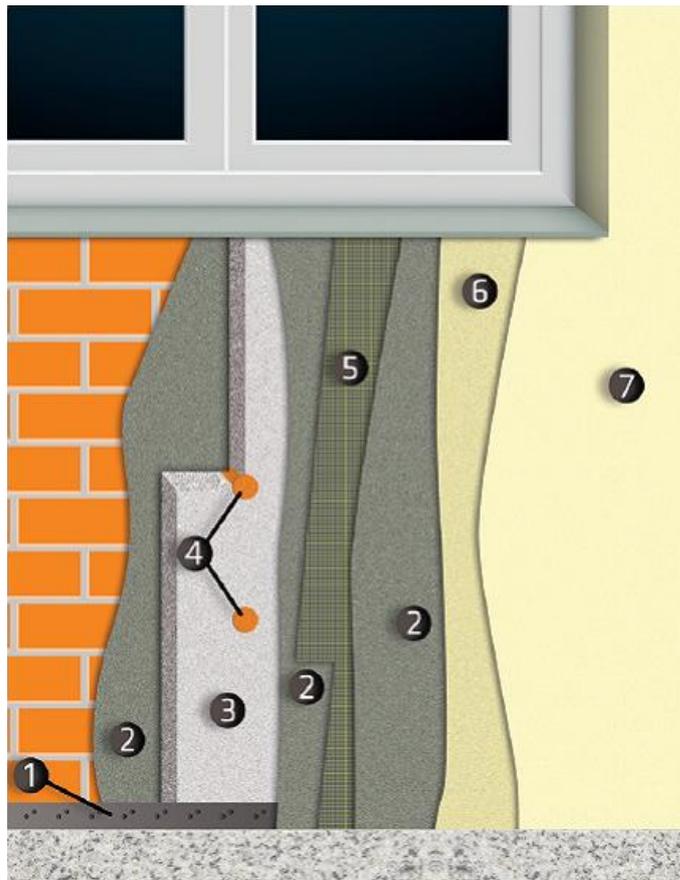
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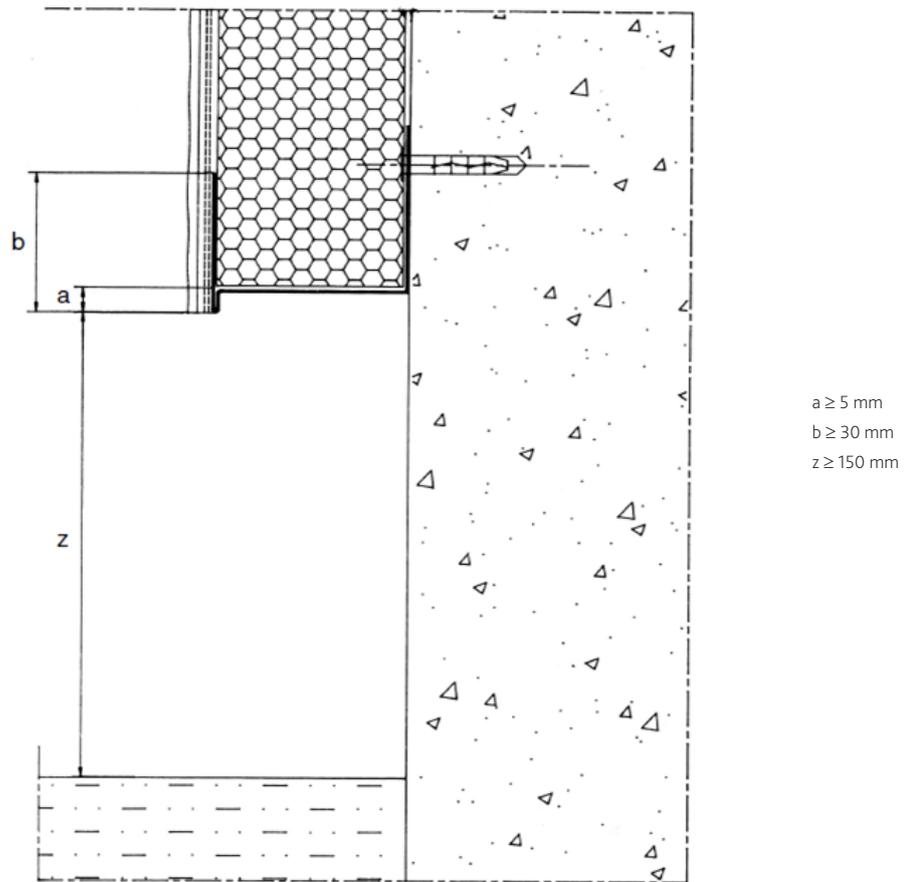
Annex 1



- 1 End profile
- 2 PRINCOL ARGAMASSA FIBRADA
- 3 POLIESTIRENO EXPANDIDO 100
- 4 PREGO DE FIXAÇÃO TDS 8
- 5 FAST TELA F167
- 6 PRIMÁRIO TEXTURADO or ARGAMASSA AREADA
and PRIMÁRIO CINOLITE HP or PROFIX HP
- 7 CARSO 1 or ERALIT or NOVATEX HD

ETICS general aspect and components

Annex 2



Vertical section of ETICS start

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Descriptors: Wall coating / External wall / Expanded polystyrene / Thermal insulation / Composite material /
/ Europe
Descritores: Revestimento de paredes / Parede exterior / Poliestireno expandido / Isolamento térmico /
/ Material compósito / Europa

