



European Technical Assessment

ETA-15/0331
of 03/04/2015

GENERAL PART

Technical Assessment Body issuing the European Technical Assessment:

Centre Scientifique et Technique du Bâtiment (CSTB)

Trade name of the construction product:

REVITHERM LdR

Product family to which the construction product belongs:

Product Area Code: 04
External Thermal Insulation Composite System with rendering (ETICS)

Manufacturer:

PPG Architectural Coatings EMEA
Immeuble « Les Fontaines »
10 rue Henri Sainte Claire Deville
F-92565 Rueil Malmaison Cedex

Manufacturing plant(s):

PPG Architectural Coatings EMEA
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This European Technical Assessment contains:

16 pages including 4 Annexes which form an integral part of this assessment

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of:

Annex 4 contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available

European Technical Approval Guideline No 004 (ETAG 004), edition 2013, used as European Assessment Document (EAD)

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SPECIFIC PART

1. Technical description of the product

The External Thermal Insulation Composite System “**REVITHERM LdR**”, subject to this European Technical Assessment (hereinafter ETA) and called ETICS in the following text, is a kit designed and installed in accordance with the Manufacturer’s instructions, deposited with the CSTB. The ETICS comprises the components listed in the following table, which are factory-produced by the Manufacturer or a supplier. The ETICS is made up on site from these components.

The ETICS also includes ancillary materials which are defined in clause 3.2.2.5 of the ETAG 004¹. They shall be used in accordance with the Manufacturer’s instructions.

The ETICS is described according to its method of fixing, as defined in clause 2.2 of the ETAG 004.

Method of fixing	Component	Coverage (kg/m ²)	Thickness (mm)
Mechanically fixed ETICS with anchors and supplementary adhesives	Insulation products		
	ECOROCK, by Rockwool, see Annex 1 (1/3)		50 to 260
	431 IESE, by Rockwool, see Annex 1 (2/3)		40 to 160
	ISOVER TF, by Saint-Gobain Isover, see Annex 1 (3/3)		40 to 200
	Supplementary adhesives		
	ENDUIT COLLE: acrylic based paste requiring addition of 30 to 37% in weight grey cement CEM II / A or B 32.5 R	3.0 to 3.5 [prepared product]	—
	PPG Mortier Poudre Collage - Calage: grey cement based powder requiring addition of about 27% in weight water	2.5 to 3.0 [powder]	—
	Anchors for insulation product		
	Plastic anchors, see Annex 2	—	—

¹ ETAG 004 is available on the EOTA website: www.eota.eu.

Method of fixing	Component	Coverage (kg/m ²)	Thickness (mm)
Mechanically fixed ETICS with anchors and supplementary adhesive	Base coat		
	ENDUIT COLLE: Paste requiring addition of 30 to 37% in weight grey cement CEM II / A or B 32.5 R, consisting of an acrylic copolymer binder in watery dispersion, calcium carbonate and silica particles and specific additives.	About 7.0 [prepared product]	Mean: 4.5 [dry] Minimal: 3.5 [dry]
	Meshes		
	Glass fibre meshes (standard and reinforced), see Annex 3		
	Key coats		
	REVITHERM PRIM: pigmented liquid (to be diluted with 10% wt. water maximum), acrylic binder, to apply before CREPITEX TR 1.5, CREPITEX TR 2.0, CREPITEX TR 2.5, CREPI INITEX 2.0 and CREPI INITEX 2.5	About 0.20	—
	SILIKAMAT PRIM: ready-to-use pigmented liquid, silicate binder, to apply before SILIKAMAT TALOCHÉ 2.0 and SILIKAMAT TALOCHÉ 2.5	About 0.20	—
	Finishing coats		
	Ready-to-use pastes - acrylic copolymer and siloxane binder: - CREPITEX TR 1.5 (particles size 1 mm) - CREPITEX TR 2.0 (particles size 1 mm)	1.5 to 1.8 About 2.0	Regulated by particles size
	Ready-to-use paste – acrylic copolymer and siloxane binder: CREPITEX TR 2.5 (particles size 1.5 mm)	2.5 to 2.6	
	Ready-to-use pastes – acrylic copolymer and siloxane binder: - CREPI INITEX 2.0 (particles size 1 mm) - CREPI INITEX 2.5 (particles size 1.5 mm)	About 2.0 About 2.5	
	Ready-to-use pastes - silicate binder: - SILIKAMAT TALOCHÉ 2.0 (particles size 1 mm) - SILIKAMAT TALOCHÉ 2.5 (particles size 1.5 mm)	About 1.8 About 2.5	

The ETICS is designed to give the walls to which it is applied satisfactory thermal insulation. The minimum thermal resistance of the ETICS shall be higher than 1.0 m².K/W.

The components are protected from moisture during transport and storage by means of appropriate packaging, unless other measures are foreseen by the Manufacturer for this purpose.

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

This ETICS is intended to be used as thermal insulation of buildings' external walls made of masonry (bricks, blocks, stones, etc.) or concrete (cast on site or as prefabricated panels).

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

The ETICS is made of non-load bearing construction elements. It does not contribute directly to the stability of the walls on which it is installed, but it can contribute to durability by providing enhanced protection from the effect of weathering.

The ETICS is not intended to ensure the airtightness of the walls.

The provisions made in this ETA are based on an assumed working life of at least 25 years, provided that the construction works are subject to appropriate design, execution, maintenance and repair. The indications given as to the working life cannot be interpreted as a guarantee given by the Manufacturer or the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

Design, execution, maintenance and repair of the construction works shall take into account principles given in chapter 7 of the ETAG 004 and shall be done in accordance with national instructions.

3. Performances of the product and references to the methods used for their assessment

Performances of the ETICS, related to the basic requirements for construction works (hereinafter BWR), were determined according to chapters 4, 5 and 6 of the ETAG 004.

These performances, given in the following paragraphs, are valid as long as the components are the ones described in § 1 and Annexes 1 to 3 of this ETA.

3.1 Mechanical resistance and stability (BWR 1)

Not relevant.

3.2 Safety in case of fire (BWR 2)

Reaction to fire:

Configuration	Declared organic content ⁽¹⁾	Declared flame retardant content ⁽¹⁾	Class according to EN 13501-1
<ul style="list-style-type: none"> Insulation product: Mineral wool panels, reaction to fire Class A1, thickness ≤ 260 mm, density ≤ 155 kg/m³ Base coat: ENDUIT COLLE Meshes: - R 131 A 101 C+ - R 131 A 102 C+ - 0161-CA Finishing coats: - CREPITEX TR 1.5 - CREPITEX TR 2.0 	Base coat: 7.4% Finishing coats: 11.9 to 12.6%	Base coat: 0% Finishing coats: 0%	B – s1, d0
<ul style="list-style-type: none"> Insulation product: Mineral wool panels, reaction to fire Class A1, thickness ≤ 260 mm, density ≤ 155 kg/m³ Base coat: ENDUIT COLLE Meshes: - R 131 A 101 C+ - R 131 A 102 C+ - 0161-CA Finishing coats: - CREPITEX TR 2.5 - CREPI INITEX 2.0 - CREPI INITEX 2.5 - SILIKAMAT TALOCHÉ 2.0 - SILIKAMAT TALOCHÉ 2.5 	Base coat: 7.4% Finishing coats: 6.5 to 11.6%	Base coat: 0% Finishing coats: 0 to 23.2%	A2 – s1, d0

⁽¹⁾ Percentage declared by the Manufacturer, relative to the dried weight of the component as delivered.

Note: a European reference fire scenario has not been laid down for façades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in façades. An additional assessment of ETICS according to national provisions (e.g., on the basis of a large scale test) might be necessary to comply with Member States regulations, until the existing European classification system has been completed.

3.3 Hygiene, health and the environment (BWR 3)

3.3.1 Water absorption – capillarity test

3.3.1.1 Water absorption of the base coat

- After 1 hour: water absorption < 1 kg/m²
- After 24 hours: water absorption < 0.5 kg/m²

3.3.1.2 Water absorption of the rendering system

Rendering system: Base coat + key coat + finishing coat indicated below	Water absorption after 24 hours	
	< 0.5 kg/m ²	≥ 0.5 kg/m ²
- CREPITEX TR 1.5 - CREPITEX TR 2.0 - CREPITEX TR 2.5 - CREPI INITEX 2.0 - CREPI INITEX 2.5 - SILIKAMAT TALOCHÉ 2.0 - SILIKAMAT TALOCHÉ 2.5	X	

3.3.2 Watertightness

3.3.2.1 Hygrothermal behaviour

Heat-rain and heat-cold cycles have been performed on a rig. The ETICS is assessed as resistant to hygrothermal cycles.

3.3.2.2 Freeze-thaw behaviour

Water absorptions of both the base coat and the rendering systems are less than 0.5 kg/m² after 24 hours. The ETICS is therefore assessed as resistant to freeze-thaw.

3.3.3 Impact resistance

Rendering system: Base coat + key coat + finishing coat indicated below	Use category		
	single standard mesh	double standard mesh	reinforced mesh + standard mesh
- CREPITEX TR 1.5 - CREPITEX TR 2.0	Category II	Category I	
- CREPITEX TR 2.5			
- CREPI INITEX 2.0 - CREPI INITEX 2.5	Category III		
- SILIKAMAT TALOCHÉ 2.0 - SILIKAMAT TALOCHÉ 2.5	Category II		

3.3.4 Water vapour permeability – resistance to water vapour diffusion

Rendering system: Base coat + key coat + finishing coat indicated below	Equivalent air thickness s_d (m)
- CREPITEX TR 1.5 - CREPITEX TR 2.0	≤ 2.0 (Test result obtained with CREPITEX TR 2.0: 1.1)
- CREPITEX TR 2.5	≤ 2.0 (Test result obtained: 1.1)
- CREPI INITEX 2.0 - CREPI INITEX 2.5	≤ 1.0 (Test result obtained with CREPI INITEX 2.5: 0.9)
- SILIKAMAT TALOCHÉ 2.0 - SILIKAMAT TALOCHÉ 2.5	≤ 1.0 (Test result obtained with SILIKAMAT TALOCHÉ 2.5: 0.3)

3.3.5 Release of dangerous substances

The ETICS belong to Category S/W2, according to EOTA Technical Report No 034.

A written declaration was submitted 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 the Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.4 Safety and accessibility in use (BWR 4)

3.4.1 Bond strength of the base coat and insulation product (ECOROCK, 431 IESE and ISOVER TF)

- Initial state: bond strength < 0.08 MPa but cohesive failure in insulation product
- After ageing: bond strength < 0.08 MPa but cohesive failure in insulation product
- After freeze-thaw cycles: test not required (see § 3.3.2.2 of this ETA)

3.4.2 Fixing strength (transverse displacement)

Test not required because the ETICS fulfils the following criteria:

$$E.d < 50,000 \text{ N/mm}$$

E modulus of elasticity of the base coat without mesh (MPa)

d mean dried thickness of the base coat (mm)

3.4.3 Resistance to wind load

3.4.3.1 Resistance to wind load of mechanically-fixed ETICS using anchors

Anchors	Plate diameter (mm)	≥ 60	
	Plate stiffness (kN/mm)	≥ 0.4	
Insulation product	Type	ECOROCK (Rockwool)	
	Tensile strength perpendicular to the face (kPa)	≥ 7.5	
	Thickness (mm)	≥ 50	≥ 120
Maximum load (Pull-through test)	Anchors not placed at the panel joints: R_{panel} (N)	Minimal: 382	Minimal: 479
		Average: 392	Average: 530

Anchors	Plate diameter (mm)	≥ 90	
	Plate stiffness (kN/mm)	≥ 0.4	
Insulation product	Type	ECOROCK (Rockwool)	
	Tensile strength perpendicular to the face (kPa)	≥ 7.5	
	Thickness (mm)	≥ 50	≥ 100
Maximum load (Pull-through test)	Anchors not placed at the panel joints: R_{panel} (N)	Minimal: 427	Minimal: 712
		Average: 450	Average: 788
	Anchors placed at the panel joints: R_{joint} (N)	Minimal: 333	Minimal: 616
		Average: 368	Average: 646

Anchors	Plate diameter (mm)	≥ 60	
	Plate stiffness (kN/mm)	≥ 0.4	
Insulation product	Type	431 IESE (Rockwool)	
	Tensile strength perpendicular to the face (kPa)	≥ 10	
	Thickness (mm)	≥ 40	≥ 100
Maximum load (Pull-through test)	Anchors not placed at the panel joints (dry conditions): R_{panel} (N)	Minimal: 441	Minimal: 758
		Average: 555	Average: 893
	Anchors placed at the panel joints (dry conditions): R_{joint} (N)	Minimal: 278	Minimal: 459
		Average: 352	Average: 559
Maximum load (Pull-through test)	Anchors not placed at the panel joints (wet conditions*): R_{panel} (N)	Minimal: 204	Minimal: 433
		Average: 251	Average: 518
	Anchors placed at the panel joints (wet conditions*): R_{joint} (N)	Minimal: 144	Minimal: 302
		Average: 177	Average: 364

* 28 days at $(70 \pm 2)^{\circ}\text{C}$ / $(95 \pm 5)\%$ RH + drying period at $(23 \pm 2)^{\circ}\text{C}$ / $(50 \pm 5)\%$ HR until constant weight.

Anchors	Plate diameter (mm)	≥ 60	
	Plate stiffness (kN/mm)	≥ 0.4	
Insulation product	Type	ISOVER TF (Saint-Gobain ISOVER)	
	Tensile strength perpendicular to the face (kPa)	≥ 15	
	Thickness (mm)	≥ 60	≥ 100
Maximum load (Pull-through test)	Anchors not placed at the panel joints (dry conditions): R_{panel} (N)	Minimal: 481	Minimal: 716
		Average: 524	Average: 793
	Anchors not placed at the panel joints (dry conditions): R_{joint} (N)	Minimal: 447	Minimal: 654
		Average: 471	Average: 680
Maximum load (Pull-through test)	Anchors not placed at the panel joints (wet conditions*): R_{panel} (N)	Minimal: 341	Minimal: 472
		Average: 376	Average: 512
	Anchors placed at the panel joints (wet conditions*): R_{joint} (N)	Minimal: 301	Minimal: 368
		Average: 320	Average: 412

* 28 days at $(70 \pm 2)^{\circ}\text{C}$ / $(95 \pm 5)\%$ RH + drying period at $(23 \pm 2)^{\circ}\text{C}$ / $(50 \pm 5)\%$ HR until constant weight.

Anchors which can be used are described in Annex 2 of this ETA.

The design wind load resistance of the ETICS fixed with anchors is determined as follows:

$$R_d = \frac{R_{\text{panel}} \cdot n_{\text{panel}} + R_{\text{joint}} \cdot n_{\text{joint}}}{\gamma}$$

n_{panel} number of anchors not placed at the panel joints, per m^2

n_{joint} number of anchors placed at the panel joints, per m^2

γ national safety factor

3.4.4 Width of crack – Render Strip Tensile Test

No performance was determined for the ETICS.

3.5 Protection against noise (BWR 5)

No performance was determined for the ETICS.

3.6 Energy economy and heat retention (BWR 6)

Thermal resistance and thermal transmittance are defined in clause 5.1.6 of the ETAG 004.

3.7 Sustainable use of natural resources (BWR 7)

No performance was determined for the ETICS.

3.8 Aspects of durability and serviceability

Bond strength after ageing*:

Rendering system: Base coat + key coat + finishing coat indicated below	Bond strength (MPa)
<ul style="list-style-type: none"> - CREPITEX TR 1.5 - CREPITEX TR 2.0 - CREPITEX TR 2.5 - CREPI INITEX 2.0 - CREPI INITEX 2.5 - SILIKAMAT TALOCHÉ 2.0 - SILIKAMAT TALOCHÉ 2.5 	≥ 0.08

* The tests were carried out on samples in EPS.

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

According to Decision 97/556/EC (Decision of the Commission of 14 July 1997, L 229 of 20.8.1997, p. 15), as amended by Decision 2001/596/EC (Decision of the Commission of 8 January 2001, L 209 of 2.8.2001, p. 33)², the systems of AVCP given in the following table apply:

Product	Intended use	Levels or classes (Reaction to fire)	System
External Thermal Insulation Composite Systems with rendering	in external walls subject to fire regulation	A1 ⁽¹⁾ , A2 ⁽¹⁾ , B ⁽¹⁾ or C ⁽¹⁾	1
		<ul style="list-style-type: none"> - A1⁽²⁾, A2⁽²⁾, B⁽²⁾, C⁽²⁾ - D, E, F - (A1 to E)⁽³⁾ 	2+
	in external walls not subject to fire regulation	any	2+

⁽¹⁾ Products/materials for which as 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).

⁽²⁾ Products/materials not covered by footnote 1.

⁽³⁾ Products/materials that do not require to be tested for reaction to fire (e.g. Products/materials of Classes A1 according to Commission Decision 96/603/EC).

The systems of AVCP are described in Annex V of Regulation (EU) No 305/2011, as amended by Delegated Regulation (EU) No 568/2014.

² Decisions are published in the *Official Journal of the European Union (OJEU)*, see www.new.eur-lex.europa.eu/oj/direct-access.html.

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at the CSTB.

The control plan is given in Annex 4. As the control plan contains confidential information, Annex 4 is not included in the published parts of this ETA.

Issued in Marne-la-Vallée on 03/04/2015

by

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Factory-prefabricated, uncoated boards made of mineral wool Ecorock (MW) according to EN 13162 and having characteristics described in the following table. Mass per unit area (kg/m^2) depends on both thickness of the board and density of mineral wool.

Reaction to fire / EN 13501-1		Class A1
Thermal resistance / EN 13163		Defined in the CE marking
Dimensional tolerances	Thickness / EN 823	T5
Dimensional stability	Under specified temperature and humidity / EN 1604: 48 h at 70°C and 90% RH	DS(TH)
Water absorption (partial immersion) / EN 1609 – method A		WS
Longterm water absorption (partial immersion) / EN 1609		WL(P)
Water vapour diffusion resistance factor (μ) / EN 12086		MU1
Tensile strength perpendicular to the faces in dry conditions / EN 1607		TR 7.5
Dynamic stiffness / EN 29052-1		No performance determined
Air flow resistance / EN 29053		No performance determined
Compressive strength / EN 826		CS(10/Y)20

ETICS REVITHERM LdR	ANNEX 1 (1/3) of ETA-15/0331
Insulation product for mechanically-fixed ETICS with anchors	

Factory-prefabricated, uncoated boards made of mineral wool 431 IESE (MW) according to EN 13162 and having characteristics described in the following table. Mass per unit area (kg/m^2) depends on both thickness of the board and density of mineral wool.

Reaction to fire / EN 13501-1		Class A1
Thermal resistance / EN 13163		Defined in the CE marking
Dimensional tolerances	Thickness / EN 823	T5
Dimensional stability	Under specified temperature and humidity / EN 1604: 48 h at 70°C and 90% RH	DS(TH)
Water absorption (partial immersion) / EN 1609 – method A		WS
Longterm water absorption (partial immersion) / EN 1609		WL(P)
Water vapour diffusion resistance factor (μ) / EN 12086		MU1
Tensile strength perpendicular to the faces in dry conditions / EN 1607		TR 10
Dynamic stiffness / EN 29052-1		No performance determined
Air flow resistance / EN 29053		No performance determined
Compressive strength / EN 826		CS(10/Y)30

ETICS REVITHERM LdR	ANNEX 1 (2/3) of ETA-15/0331
Insulation product for mechanically-fixed ETICS with anchors	

Factory-prefabricated, uncoated boards made of mineral wool ISOVER TF (MW) according to EN 13162 and having characteristics described in the following table. Mass per unit area (kg/m^2) depends on both thickness of the board and density of mineral wool.

Reaction to fire / EN 13501-1		Class A1
Thermal resistance / EN 13163		Defined in the CE marking
Dimensional tolerances	Thickness / EN 823	T5
Dimensional stability	Under specified temperature and humidity / EN 1604: 48 h at 70°C and 90% RH	DS(TH)
Water absorption (partial immersion) / EN 1609 – method A		WS
Longterm water absorption (partial immersion) / EN 1609		WL(P)
Water vapour diffusion resistance factor (μ) / EN 12086		MU1
Tensile strength perpendicular to the faces in dry conditions / EN 1607		TR 15
Dynamic stiffness / EN 29052-1		No performance determined
Air flow resistance / EN 29053		No performance determined
Compressive strength / EN 826		CS(10/Y)40

ETICS REVITHERM LdR	ANNEX 1 (3/3) of ETA-15/0331
Insulation product for mechanically-fixed ETICS with anchors	

Anchors with ETA according to European Technical Approval Guideline No 014 (hereinafter ETAG 014). The anchors are composed of a plastic expansion sleeve with a plate having diameter of 60 mm and a plastic or metallic nail or screw. Use categories and characteristic resistances in the substrate are given in each anchor's ETA. Validity of the anchor's ETA shall be checked before using the anchor.

Trade name	ETA reference	Mounting ⁽¹⁾	Plate stiffness (kN/mm)
Ejotharm NTK U	ETA-07/0026	a	≥ 0.4
Ejotharm STR U 2G	ETA-04/0023	a, b	
Ejot H1 eco	ETA-11/0192	a	

⁽¹⁾ a: surface mounting; b: countersunk mounting.

These characteristics, the use categories and the characteristic resistances in the substrate shall be taken from the corresponding anchor's ETA.

ETICS REVITHERM LdR	ANNEX 2 of ETA-15/0331
Anchors for insulation product	

Glass fibre meshes:

- standard mesh: with mesh size between 3 and 6 mm;
- reinforced mesh: implemented in addition to the standard mesh, to improve the impact resistance.

Trade name	Mass per unit area (g/m ²)	Residual strength after ageing (N/mm)		Relative residual strength after ageing (%) ⁽¹⁾	
		Warp	Weft	Warp	Weft
Standard meshes					
ARMATURE 500 (R 131 A 101 C+)	166	≥ 20	≥ 20	≥ 50	≥ 50
ARMATURE 500 (0161-CA)	156	≥ 20	≥ 20	≥ 50	≥ 50
ARMATURE 150 (R 131 A 102 C+)	161	≥ 20	≥ 20	≥ 50	≥ 50
Reinforced mesh					
ARMATURE HR (ARS 208)	710	≥ 20	≥ 20	≥ 40	≥ 40

⁽¹⁾ Percentage of the strength in the as-delivered state.

ETICS REVITHERM LdR	ANNEX 3 of ETA-15/0331
Glass fibre meshes	