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General Part

Technical Assessment Body issuing the European Technical Assessment:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Trade name of the construction product	**Sistema RHONATHERM® TF**
Product family to which the construction product belongs	External Thermal Insulation Composite System with rendering for use on timber frame building
Manufacturer	**Pinturas ISAVAL®, S.L.** C/ Velluters, parcela 2 - 14 - Pol. Ind. Casanova 46394 - Ribarroja del Turia, Valencia - Spain
Manufacturing plant(s)	C/ Velluters, parcela 2 - 14 - Pol. Ind. Casanova 46394 - Ribarroja del Turia, Valencia - Spain.
This European Technical Assessment contains	9 pages + Annex 1 contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	040089-00-0404: ETICS WITH RENDERINGS FOR THE USE ON TIMBER FRAME BUILDINGS

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

1 Technical description of the product

The External Thermal Insulation Composite System (from now on, referred to as ETICS) with rendering to be applied on timber frame buildings "RHONATHERM TF" are designed and installed in accordance with the ETA Holder'. It is made up on site from their components. The manufacturer is ultimately responsible for these ETICS.

RHONATHERM® TF is installed on external boards of Wood-based panels (organic bonding), Cement bonded particle boards, Fibre-cement panels (cement bonded fibre boards), Gypsum bonded particle boards, Gypsum plaster boards and Fibre-gypsum panels (gypsum bonded fibre boards).

These ETICS are defined as:
- "bonded system with supplementary mechanical fixings" with is used with EPS-XPS panels,
- "mechanically fixed ETICS with supplementary adhesive" with is used with MW panel.

The minimum number of fasteners per square metres are 6 for EPS. XPS and MW and 8 fasteners for building higher than 24 m.

ETICS using other facings such as brick slips or tiles are not covered by this EAD.

This ETICS comprises the following components, which are factory produced by the manufacturer or a supplier.

<table>
<tr><th colspan="7">Components</th><th>Coverage ([kg/m²)</th><th>Thickness [mm]</th></tr>
<tr><td rowspan="3">Adhesive</td><td colspan="6">RHONATHERM® RHONA T-621. Minimum bonded surface: 45 % for EPS/ XPS and 80 % for MW. (ready to use mortar based on acrylic copolymers). For all substrates indicated in this ETA.</td><td>1.5 – 2.0 (paste, and per mm layer thickness)</td><td rowspan="3">≥ 3,0</td></tr>
<tr><td colspan="6">RHONATHERM® RHONA T-700. Minimum bonded surface: 45 % for EPS/ XPS and 80 % for MW. (cement-based mortar in powder requiring addition and mixing with 29 ± 1,0 % water). For all substrates indicated in this ETA except for timber frame substrate and fibre-gypsum panels.</td><td rowspan="2">1,2 – 1,5 (powder, and per mm layer thickness)</td></tr>
<tr><td colspan="6">RHONATHERM® RHONA T-600. Minimum bonded surface: 45 % for EPS/XPS and 80% for MW. (cement-based mortar in powder requiring addition and mixing with 27 ± 2,0% water. For all substrates indicated in this ETA except for timber frame substrate and fibre-gypsum panels.</td></tr>
<tr><td rowspan="3">Thermal Insulation + method of fixing</td><td colspan="6">RHONATHERM® PANEL EPS: Bonded Board of Expanded polystyrene (EPS) (EN 13163) with supplementary mechanical fixings (minimum 6 fasteners/m²)</td><td>0,15 – 5,0</td><td>10 - 240</td></tr>
<tr><td colspan="6">RHONATHERM® PANEL XPS: Bonded Board of Extrued polystyrene (XPS) (EN 13164) with supplementary mechanical fixings (minimum 6 fasteners/m²)</td><td>1,0 – 8.5</td><td>40 - 240</td></tr>
<tr><td colspan="6">RHONATHERM® PANEL MW: Mechanically fixed Mineral wool (MW) (EN 13162) with supplementary adhesive (minimum 6 fasteners/m²)</td><td>3,0 – 35.0</td><td>20 - 240</td></tr>
<tr><td rowspan="6">Mechanically fixing</td><td colspan="6">Plastic anchors (expansion element and sleeve) for insulation material with different lengths in relation with thickness of insulation board.</td><td colspan="2" rowspan="5">Remain under the manufacturer responsibility .</td></tr>
<tr><td>Fasteners</td><td colspan="2">ETA n.º</td><td>Diameter Plate (mm)</td><td>Stiffness (kN/mm)</td><td>Minimum tension load (N)*</td></tr>
<tr><td>RHONATHERM®</td><td colspan="2">04 / 0023 - STR U 2G, SDK U</td><td>60</td><td>0,6</td><td>600</td></tr>
<tr><td>Fijación</td><td colspan="2">20 / 0670 - STR H, STR H A2</td><td>60</td><td>2.7</td><td>760</td></tr>
<tr><td colspan="6">*These values show the minimum pull out of the fastener in the weakest support (enclosed in its ETA). Other higher values appear in their ETAs.</td></tr>
<tr><td colspan="6">Other fasteners can be used with CE marking (EAD 330196-00-0604), they have to have a plate dimension ≥ 60 mm diameter and Stiffness ≥ 0,6 kN/mm.
An additional larger washer can be used with RHONATHERM® PANEL MW</td></tr>
<tr><td>Ancillary elements</td><td colspan="6">Aluminium and PVC profiles: base, corners, top and window sills, expansion joint and its fixing devices</td></tr>
<tr><td colspan="9">Rendering systems are composed by base coat + key coat+ finishing coats:</td></tr>
<tr><td>Base coat</td><td colspan="6">RHONATHERM® RHONA T-700. Cement-based mortar
+ Single Malla RHONATHERM® RHONAMESH T-150, or
+ double Malla RHONATHERM® RHONAMESH T-150, or
+ Malla RHONATHERM® RHONAMESH T-350 + Malla RHONATHERM® RHONAMESH T-150</td><td>1,2 – 1,5 (powder, and per mm layer thickness)</td><td>3 - 5</td></tr>
<tr><td rowspan="11">Glass fibre mesh</td><td colspan="6">Malla RHONATHERM® RHONAMESH T-150. Glass fibre mesh resistant to the alkalis</td><td>0,16</td><td>0,58</td></tr>
<tr><td colspan="6">Malla RHONATHERM® RHONAMESH T-350. Glass fibre mesh resistant to the alkalis</td><td>0,35</td><td>0,90</td></tr>
<tr><td colspan="8">Other different mesh can be used in this ETICS as substitute for RHONATHERM® RHONAMESH T-150, if they have the CE marking according to EAD 040016-00-0404 and the following characteristics</td></tr>
<tr><td colspan="3">Characteristics</td><td colspan="4">Values (150 / 350)</td></tr>
<tr><td colspan="3">Mesh size (mm)</td><td colspan="4">(3,5 x 3,8) ± 0,5</td></tr>
<tr><td colspan="3">Elongation after ageing (%)</td><td colspan="4">≤ 3,8</td></tr>
<tr><td colspan="3">Tensile strength after ageing (N/mm)</td><td colspan="4">≥ 20</td></tr>
<tr><td colspan="3">Mass per unit area (g/m²)</td><td colspan="4">≥ 160 / ≥ 300</td></tr>
<tr><td colspan="3">Thickness</td><td colspan="4">0,58 ± 0,2 mm / 0,90 ± 0,2 mm</td></tr>
<tr><td colspan="3">Organic content</td><td colspan="4">20 ± 4</td></tr>
<tr><td colspan="8">After ageing (alkali conditioning), the mean value of residual strength of the standard mesh (see EAD 1.3.8.1) in the weft and warp direction shall be at least: 50 % of the strength in the as-delivered state and ≥ 20 N/mm.</td></tr>
</table>

1 Primer coat + Finishing coat	***RHONATHERM® REVIQUARZ PRIMER***	Acrylic primer which may require optionally 10-15 % water	0,35 - 0,4	----
	RHONATHERM® REVIQUARZ G-02/05/10/15/20, Q-150/200	Ready to use acrylic mortar with different size grading particles (0.2 mm - 2 mm)	1.0 – 4.0	0.2 – 2.5
	RHONATHERM® REVIQUARZ SC	Ready to use silicone mortar with different size grading particles (0.5 mm - 2 mm)		
	RHONATHERM® REVIQUARZ NT	Ready to use acrylic nanotechnological mortar with different size grading particles (0.5 mm - 2 mm)		
	RHONATHERM® REVIQUARZ ELASTICO SE	Semi-thick acrylic elastic coating.		
	REVIQUARZ FSC	Ready to use silicone photocatalytic mortar with different size grading particles (0.5 mm – 2 mm)	1.0 – 4.0	0.2 – 2.5
2 Primer coat + Finishing coat	**REVIQUARZ FSS PRIMER**	Ready to use sol-silicate primer	0.3 – 0.5	
	REVIQUARZ FSS	Ready to use sol-silicate photocatalytic mortar with size grading particles of 1 mm.	1.0 – 2.0	1.0 – 1.5
Decorative coat	**HIDROFUGANTE INVISIBLE ACQUA**	Water-repellent impregnation agent based on silanes and siloxanes for absorbent surfaces.	0.2 - 0.6	< 0.2

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

2.1 Intended use(s)

The ETICS are designed to give the timber frame-building wall to which they are applied additional thermal insulation and protection from effects of weathering.

The ETICS can be used on new or existing (retrofit) vertical timber frame building walls. They can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The surface for the application of ETICS can be a board substrate (wood based panels, solid wood panels, plasterboards, gypsum bonded boards, cement bonded boards, etc.).

The board substrate must be suitable for humid conditions as specified in EN 13986.

This ETICS is made of non-load bearing construction elements. They do not contribute directly to the stability of the timber frame building wall on which they are installed, but it can contribute its durability by providing enhanced protection from the effect of weathering.

ETICS are not intended to ensure the air tightness of the timber frame building structure. This ETA covers application of ETICS on the indicated panels (gypsum, wood, etc.) on structures of concrete.

2.2 Relevant general conditions for the use of the kit

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 ETICS for the intended use of 25 years when installed in the works (provided that ETICS is subject to appropriate installation). These provisions are based upon the current state of the art and the available knowledge and experience.

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.

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 ETA. 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 large enough to ensure that ETICS is not subjected to deformations, which could lead to damage.

*Design***.** In any case, the user shall comply with the national regulations and particularly concerning fires 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 (connection, joint, etc.) shall be designed in order to avoid water penetration behind the system. The minimal surface area for the bonded ETICS, and the method of bonding shall comply with the characteristics of the ETICS as well as the national regulations. In any case, the minimal surface shall be at

least 45 % for EPS/XPS and 80% for MW. Besides, the numbers of fasteners used with MW must comply with the National requirements(1).

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 manufacturer 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 repairing of localised damaged areas due to accidents
- The application of various products or paints, possibly after washing or ad hoc 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

The identification tests and the assessment for the intended use of this ETICS according to the Basic Work Requirements (BWR) were carried out in compliance with EAD 040083-00-0404, The characteristics of each system shall correspond to the respective values laid down in following tables of this ETA, checked by IETcc.

Methods of verification and of assessing and judging are listed afterwards.

3.1 Safety in case of fire (BWR 2)

<table>
<tr><th colspan="4">Basic requirement for construction works 2: Safety in case of fire</th></tr>
<tr><th colspan="2">Essential characteristic</th><th>Relevant clause in EAD</th><th>Performance</th></tr>
<tr><td colspan="2">Reaction to fire of ETICS</td><td>2.2.1.1</td><td rowspan="3">Fire classification*</td></tr>
<tr><td colspan="3">System composition
(Adhesive + Insulation + Base coat + primer + finishing coat)</td></tr>
<tr><td>System composition:
Adhesive: RHONATHERM® RHONA T- 621 +</td><td colspan="2">Finishing coat</td></tr>
<tr><td rowspan="5">Insulation: EPS/XPS
RHONATHERM® RHONA T- 700 + RHONAMESH T-150 + RHONATHERM® REVIQUARZ PRIMER +
One of these finishing layers</td><td colspan="2">RHONATHERM® REVIQUARZ Q/G</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ SC</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ NT</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ ELASTICO SE</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ FSC</td><td>B-s1,d0</td></tr>
<tr><td rowspan="5">Insulation: MW
RHONATHERM® RHONA T- 700 + RHONAMESH T-150 + RHONATHERM® REVIQUARZ PRIMER +
One of these finishing layers</td><td colspan="2">RHONATHERM® REVIQUARZ Q/G</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ SC</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ NT</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ ELASTICO SE</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">RHONATHERM® REVIQUARZ FSC</td><td>B-s1,d0</td></tr>
<tr><td>Insulation: EPS/XPS
RHONATHERM® RHONA T- 700 + RHONAMESH T-150 + RHONATHERM® REVIQUARZ FSS PRIMER +</td><td colspan="2">RHONATHERM® REVIQUARZ FSS</td><td>B-s1,d0</td></tr>
<tr><td>Insulation: MW
RHONATHERM® RHONA T- 700 + RHONAMESH T-150 + RHONATHERM® REVIQUARZ FSS PRIMER +</td><td colspan="2">RHONATHERM® REVIQUARZ FSS</td><td>B-s1,d0</td></tr>
<tr><td colspan="2">Reaction to fire of the mechanical fixings</td><td>2.2.1.2</td><td>ETA 04 / 0023
(STR U 2G, SDK U)
ETA 20 / 0670
(STR H, STR H A2)</td></tr>
<tr><td colspan="2">Reaction to fire of thermal insulation material</td><td>2.2.1.3</td><td>EPS: E
XPS: E
MW : A1</td></tr>
<tr><td colspan="4">*Without or with HIDROFUGANTE INVISIBLE ACQUA</td></tr>
</table>

(1) The value of the pull through to calculate the numbers of fasteners will be the minor value between the average value of pull through fastener-MW (defined in this ETA)and the average value pull out of the fastener-support (defined in its ETA).

3.2 Hygiene, health and environment (BWR 3)

Basic requirement for construction works 3: Hygiene, health, and the environment				
Essential characteristic	**Relevant clause in EAD**	**Performance**		
Water absorption of the ETICS	2.2.2.1	Rendering	After 1h kg/m²	After 24h kg/m²
		RHONATHERM® RHONA T-700	0.06	0.48
		RHONATHERM® REVIQUARZ Q/G	0.08	0,3
		RHONATHERM® REVIQUARZ SC	0,04	0,2
		RHONATHERM® REVIQUARZ NT	0.1	0,48
		RHONATHERM® REVIQUARZ FSS	0.07	0.37
		RHONATHERM® REVIQUARZ ELASTICO SE	0.009	0.05
		RHONATHERM® REVIQUARZ FSC	0.07	0.30
Water-tightness of the ETICS Hygrothermal behaviour	2.2.2.2	The ETICS is assessed resistant to hygrothermal cycles on a rig, passed the test without defects and without pass through of water. The tests was performed on OSB and Gypsum boards.		
Water tightness: Freeze-thaw behaviour	2.2.2.3	The water absorption of the base coat and of rendering system is less than 0.5 kg/m² after 24 hours and so the system can be assessed as freeze/thaw resistant without any further testing.		
Water tightness: Moisture content and gradient	2.2.2.4	NPA		
Water tightness: Water penetration	2.2.2.5	NPA		
Water vapour permeability of the ETICS	2.2.2.6	Base coat + finishing coat	(S_d, m)	Required
		RHONATHERM® RHONA T-700	0,1	< 1
		RHONATHERM® REVIQUARZ Q/G	0,4	
		RHONATHERM® REVIQUARZ SC	0,4	
		RHONATHERM® REVIQUARZ NT	0,4	
		RHONATHERM® REVIQUARZ ELASTICO SE	0.8	
		Any finishing coat + HIDROFUGANTE INVISIBLE ACQUA	NPA	
		RHONATHERM® REVIQUARZ FSS	0.3	
		RHONATHERM® REVIQUARZ FSC	0.9	
Water absorption of the thermal insulation	2.2.2.7	RHONATHERM® PANEL EPS: EN ISO 29767: ≤ 1 kg/m²		
		RHONATHERM® PANEL XPS: EN ISO 29767: ≤ 1 kg/m²		
		RHONATHERM® PANEL MW: EN ISO 29767: ≤ 1 kg/m²		
Water vapour permeability of the thermal insulation	2.2.2.8	RHONATHERM® PANEL EPS: EN 12086: μ = 30 -70		
		RHONATHERM® PANEL XPS: EN 12086: $\mu \geq 60$		
		RHONATHERM® PANEL MW: EN 12086: μ = 1		

3.3 Safety and accessibility in use (BWR 4)

Basic requirement for construction works 4: Safety and accessibility in use					
Essential characteristic	**Clause EAD**	**Performance** (minimum / mean value)(kPa)			
Bond strength between base coat and insulation product	2.2.3.1	Thermal insulation	Initial state	After hydrothermal cycles (rigs)	After free/thaw cycles (on the samples)
		EPS	144 / 155	110 / 147	-----
		XPS	180 / 200	150 / 192	-----
		MW	10 / 10	10 / 10	-----
		The breakage location was 100 % on the insulation board MW and EPS Adhesive on XPS			
Bond strength between adhesive and substrate (external boards)	2.2.3.2	*Support + adhesive*	Initial state	After conditioning at (23 ± 2)°C and (95 ± 5) %RH for 7 days (humid conditions),	After conditioning at (23 ± 2)°C and (95 ± 5) %RH for 7 days and 7 days drying at (23 ± 2)°C and (50 ± 5)%RH
		OSB + T621	180 / 234	90 / 130	100 / 164
		Yeso + T621	200 / 250	130 / 168	180 / 266
		Concrete + T-621	1368 / 2124	-	-
		Fibre-cement +T-621	1148 / 2037	799 / 1119	938 / 1283
		Fibre-cement +T-700	299 / 432	170 / 327	230 / 280
		Fibre-cement +T-600	251 / 285	230 / 276	190 / 255
Bond strength between adhesive and insulation	2.2.3.3	*Support + adhesive*	Initial state	Immersion 48 h and 2 h drying	Immersion 48 h and 7 d drying
		EPS + T-621	140 / 173	80 / 128	140 / 165
		XPS + T-621	280 / 440	200 / 371	349 / 438
		MW + T-621	25 / 25	25 / 25	25 / 25
		EPS + T-600	80 / 109	80 / 113	100 / 150
		XPS + T-600	120 / 150	100 / 140	150 / 220
		MW + T-600	7 / 7	7 / 9	6 / 7
		EPS + T-700	150 / 200	150 / 170	160 / 180
		XPS + T-700	170 / 200	200 / 200	200 / 200
		MW + T-700	20 / 20	10 / 10	10 / 10
		The breakage location was 100 % on the insulation board MW and EPS. Adhesive on XPS			

Fixing strength (transverse displacement test)	2.2.3.5	The test is not required since mechanically fixed ETICS with supplementary adhesive, where the bonded area exceeds 20 %.
Wind load resistance of mechanically fixed ETICS	2.2.3.6	
- pull-through of the fasteners	2.2.3.6.1	In the middle of RHONATHERM® PANEL MW of 6 cm with TR ≥ 7,5 (minimum / mean value)(kN/fastener)
		Dry condition (Center // border) / Wet condition (Center // border)
		0,23 / 0,26 // 0.21 / 0.24 / 0,19 / 0,23 // 0.12 /0.14
- Static foam block test	2.2.3.6.2	It is not required for ETICS with adhesive
- dynamic wind uplift test	2.2.3.6.3	It is not required for ETICS with insulation panels of EPS, XPS or MW
- resistance to soft body impact	2.2.3.6.4	NPA
Tensile resistance of insulation product: in dry conditions	2.2.3.7	RHONATHERM® PANEL EPS: EN 1607, TR = 100 kPa RHONATHERM® PANEL XPS: EN 1607, TR = 200 kPa RHONATHERM® PANEL MW: EN 1607, TR = 7,5 kPa
Tensile resistance of insulation product: in wet conditions.	2.2.3.8	NPA
Shear strength / shear modulus of elasticity th.Insulation	2.2.3.9	RHONATHERM® PANEL EPS: EN 12090: Shear strength(kPa): 75; Shear modulus (kPa):1000 RHONATHERM® PANEL XPS: EN 12090: Shear strength(kPa): 150; Shear modulus (kPa):1000
Tensile strength of rendering system	2.2.3.12	NPA
Pull-out strength of mechanical fixings (anchors, staples, screws, etc.)	2.2.3.14	See ETA of the fasteners
Hardened base coat: Dynamic modulus of elasticity and shrinkage behaviour of hardened base coat with a thickness greater than 5 mm	2.2.3.15	NPA

Impact resistance (Category)	2.2.3.19	Rendering		**150**	**Double 150**
		Thermal insualtaion + RHONATHERM® RHONA T-700 (impact diameter mm: 3j/10J)			
		RHONATHERM® RHONA T-700	EPS	III (18/ 32)	----
			XPS	----	----
			MW	III (10/ 30)	----
		RHONATHERM® REVIQUARZ Q/G	EPS	II (19 / 35)	II (10 / 33)
			XPS	III (12/26)	II (5 / 20)
			MW	II (10/35)	II (10 / 20)
		RHONATHERM® REVIQUARZ SC	EPS	II (20 / 40)	II (0 / 25)
			XPS	III (10/28)	II (5/18)
			MW	II (17/30)	II (0 / 25)
		RHONATHERM® REVIQUARZ NT	EPS	II (20 / 40	II (6 / 25)
			XPS	II (12/25)	II (8/15)
			MW	II (0 / 26)	II (0 / 22)
		RHONATHERM® REVIQUARZ ELASTICO SE	EPS	I (20 / 28)	I (12 / 22)
			XPS	I (18/32)	I (7/20)
			MW	I (10/ 35)	I (10 /20)
				150	**350 +150**
		RHONATHERM® REVIQUARZ FSS	EPS	III (20 / 38)	III (18 / 34)
			XPS	III (20 / 38)	----
			MW	III (24 / 39)	II (10 - 29)
		RHONATHERM® REVIQUARZ FSC	EPS	III (24 / 38)	II (11 / 27)
			XPS	III (16 / 40)	-----
			MW	II (10 / 35)	II (9 /20)

Bond strength after ageing of ETICS: finishing coat tested on the rig	2.2.3.20	**Rendering**	**EPS**	**XPS**	**MW**
			(minimum / mean value) (kPa)		
		RHONATHERM® REVIQUARZ Q/G	100 / 150	150 / 200	10 / 10
		RHONATHERM® REVIQUARZ SC	100 / 150	150 / 200	10 / 10
		RHONATHERM® REVIQUARZ NT	100 / 150	150 / 200	10 / 10
		RHONATHERM® REVIQUARZ ELASTICO SE	100 / 150	150 / 200	10 / 10
		RHONATHERM® REVIQUARZ FSS	100 / 120	-----	10 / 10
		RHONATHERM® REVIQUARZ FSC	130 / 160		10 / 10
		The breakage location was 100% on the insulation board			

Bond strength after ageing of ETICS: finishing coat NOT tested on the rig	2.2.3.21	**Rendering**	**XPS**
		RHONATHERM® REVIQUARZ FSS	150 / 180
		RHONATHERM® REVIQUARZ FSC	210 / 260
		The breakage location was 100% on the insulation board	

Reinforcemetn Tensile strength and elongation	2.2.3.23	Status	Warp		Weft	
			150	350	150	350
		Initial / After ageing (N/ mm)	44 / 22	38/10	45 / 25	38/10
		Deference (%)	≤ 50			
		Elongation after ageing (%)	≤ 4			

3.4 Energy economy and heat retention (BWR 6)

Thermal resistance and thermal transmittance of the ETICS (2.2.5.1) The additional thermal resistance provided by the ETICS (R_{ETICS}) to the substrate wall is calculated from the thermal resistance of the thermal insulation product ($R_{insulation}$), determined in accordance with 2.2.23.1, and from either the tabulated R render value of the render system (R_{render} is about 0.02 m^2K/W) or R_{render} determined by test according to EN 12667 or EN 12664 (depending on expected thermal resistance).

$$R_{ETICS} = R_{insulation} + R_{render} \ [(m^2 \cdot K)/W]$$

as described in EN ISO 10456.

The thermal bridges caused by mechanical fixing devices influence the thermal transmittance of the entire wall and shall be taken into account using the following calculation:

$$U_c = U + \Delta U \ [W/(m^2 \cdot K)]$$

With: U_c corrected thermal transmittance of the entire wall, including thermal bridges.
U thermal transmittance of the entire wall, including ETICS, without thermal bridges:

$$U = \frac{1}{R_{ETICS} + R_{substrate} + R_{se} + R_{si}}$$

$R_{substrate}$ thermal resistance of the substrate wall [$(m^2 \cdot K)/W$]
R_{se} external surface thermal resistance [$(m^2 \cdot K)/W$]
R_{si} internal surface thermal resistance [$(m^2 \cdot K)/W$]
ΔU correction term of the thermal transmittance for mechanical fixing devices
$= \chi_p * n$ (for anchors) + $\Sigma\psi i * \ell i$ (for profiles) (formula x)
χ_p point thermal transmittance value of the anchor [W/K]. If not specified in ETA for anchors, the following values apply:
= 0.002 W/K for anchors with a plastic screw/nail, stainless steel screw/nail with the head covered by at least 15 mm plastic material, or with a minimum 15 mm air gap at the head of the screw/nail.
= 0.004 W/K for anchors with a galvanized carbon steel screw/nail with the head covered by at least 15 mm a plastic material or a minimum 15 mm air gap at the head of the screw/nail.
= 0.008 W/K for all other anchors (worst case)
n number of anchors per m^2. In case n is more than 16, the formula (x) is not applied.
ψi linear thermal transmittance value of the profile [W/(m·K)]
ℓi length of the profile per m^2.

The influence of thermal bridges can also be calculated as described in EN ISO 10211.
It shall be calculated according to this standard if there are more than 16 anchors per m^2 foreseen. The declared χ_p -values do not apply in this case.

Basic requirement for construction works 6: Energy economy and heat retention		
Essential characteristic	**Relevant clause in EAD**	**Performance**
Insulation products: thermal resistance	2.2.5.2	RHONATHERM® PANEL EPS λ_D = 0,037 W/mK
		RHONATHERM® PANEL XPS λ_D = 0.034 - 0,036 W/mK
		RHONATHERM® PANEL MW λ_D = 0,036 W/mK
Air flow resistance of insulation product	2.2.5.3	RHONATHERM® PANEL MW. NPA

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

According to the decision 1997/556/EC of the European Commission a system 2+ applies.

In addition, with regard to reaction to fire for products covered by this EAD the applicable European legal act is Decision 1997/556/EC as amended by Decision 2001/556/EC.

The systems 1 and 2+ apply to ETICS with regard to reaction to fire. System 1 for ETICS for which the following is valid:
- intended use in external walls subject to reaction to fire regulations,
- reaction to fire classes A1, A2, B or C,
- made of materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material).

Product	Intended uses	Level or Classes	System
RHONATHERM® TF	External Thermal Insulation Composite System with rendering for use on building walls	Any	+2

This system of attestation of conformity +2 is defined as follows:

Tasks for the manufacturer: Initial type-testing of the product and Factory production control and Testing of samples taken at the factory in accordance with a prescribed test plan.

Tasks for the notified body: Certification of factory production control on the basis of:

- Initial inspection of factory and of factory production control.
- Continuous surveillance (annual), assessment and assessment of factory production control.

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 which is deposited at IETcc[(2)].

5.1 Tasks of the manufacturer

Initial type-testing of the product. The initial type-testing have been conducted by the IETcc to issue this ETA in accordance with the EAD 040089-00-0404 "ETICS WITH RENDERINGS FOR THE USE ON TIMBER FRAME BUILDINGS". The verifications underlying this ETA have been furnished on samples from the current production.

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 including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the Control Plan. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

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

Other tasks of the manufacturer. The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 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 bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this ETA.

5.2 Tasks of notified bodies.

Initial inspection of factory and of factory production control. The Notified Body 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 clause 2 of this ETA.

Continuous surveillance, assessment and verification of factory production control. In accordance with the provisions laid down in the control plan, at least one per year.

[(2)] The Control Plan is a confidential part of the ETA and only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report. The notified certification body involved by the manufacturer shall issue a Certificate of factory production control stating the conformity of 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 to IETcc immediately.

Issued in Madrid on 24 of june of 2024

By

Director
on behalf of Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc – CSIC)