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## **European Technical Assessment**

ETA 10/0231 of 20/06/2018

English translation prepared by IETcc. Original version in Spanish language

### **General Part**

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) N°305/2011:

Instituto de Ciencias de la Construcción Eduardo

Trade name of the construction product

Product family to which the construction product belongs

Manufacturer

Manufacturing plant(s)

This European Technical Assessment contains

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

Torroja (IETcc)

**TERMOK8® IVAS** 

External Thermal Insulation Composite System with rendering for use on building walls

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11 pages including 2 Annexes which form an integral part of this assessment. Annex 3. Contain confidential information and is not included in the ETA when that assessment is publicly available.

Guideline for European Technical Approval (ETAG) nº 004 ed. 2013, used as European Assessment Document (EAD)

ETA 10/0231 issued on 06/03/2017 This version replaces

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#### SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

#### 1 Technical description of the product

The External Thermal Insulation Composite System (from now on, referred to as ETICS) "TERMOK8® IVAS" is designed and installed in accordance with the manufacturer, design and installation instructions, deposited at the IETcc<sup>(1)</sup>.

It is made up on site from these components. The manufacturer is ultimately responsible for the ETICS. TERMOK8® IVAS which is a bonded system with supplementary mechanical fixings with EPS panel and mechanically fixed ETICS with supplementary adhesive on MW panel. The minimum number of fasteners per square metres are 6 for EPS and MW.

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

	Components	Coverage ([kg/m²)	Thickness [mm]
Insulation material with	Insulation material: ISOVER CLIMA 34 " factory prefabricated mineral wool (MW) boards according to EN 13162 (2)	2,4-12	40-160
associated	<b>IVAS PANEL EPS</b> (white, grey and other colors EPS*: <i>Bonded</i> Board of Expanded polystyrene (EPS) (EN 13163) with supplementary mechanical fixings (minimum 6 fasteners/m²	0,4-3,5	30-200
method of fixing	<u>Adhesive:</u> <b>KLEBOCEM.</b> Minimum bonded surface: 40% over EPS Board and 80% over MW board.(grey or white cement based mortar in powder requiring addition and mixing with $23.0 \pm 1.0\%$ water)	2,5-3,5 (powder, and	3,0-5,0
Base coat	<b>KLEBOCEM</b> Same product described above. (Fully applied in two layers on external side of insulation boards, with glass fibre alkali resistant mesh imbibed in between).	per mm layer thickness)	3,0 3,0
Glass fibre	ARMATEX C1. Standard glass fibre alkali resistant mesh.	0,14-0,18	0,5
mesh	ARMTEX C1 "R. Reinforced glass fibre alkali resistant mesh	0,34-0,36	0,9
	RIVATONE PLUS G12. Acrylic binder based ready to use paste.	1,5 - 2,5	$1,2 \pm 0,1$
	RIVATONE PLUS G15. Acrylic binder based ready to use paste.	2,5 - 3,5	$1,5 \pm 0,1$
Finishing coat	RIVATONE IDROSILICONICO PLUS G12. Acrylic Silicone binder based ready to use paste.	1,5 - 2,5	$1,2 \pm 0,1$
Firisining coat	RIVATONE IDROSILICONICO PLUS G15. Acrylic Silicone binder based ready to use paste.	2,5 - 3,5	$1,5 \pm 0,1$
	RIVATONE PLUS TRV G12. Acrylic-Silicone binder based ready to use paste.	1,5 - 2,5	$1,2 \pm 0,1$
	RIVATONE PLUS TRV G15.Acrylic-Silicon binder based ready to use paste.	2,5 - 3,5	$1,5 \pm 0,1$
	Anchors with sleeve made of plastic and expansion nail made of either plastic or metal, for insulation		
Fasteners	material with different lengths in relation with thickness of insulation board: Tassello H1, Tassello	Remain ı	under the
	H3,Tassello CT 2G, Rondella per lana di roccia		acturer
Ancillary elements	Aluminium and PVC profiles: (base, corners, top and window sills, expansion joint) and its fixing devices	respor	nsibility

## 2 Specification of the intended use in accordance with the applicable EAD

This ETICS is intended to be used as external thermal insulation for building walls. The walls are made of masonry (bricks, 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.

This 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 its durability by providing enhanced protection from the effect of weathering.

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 airtightness of the building structure.

Design and installation of ETICS should take into account principles laid down in chapter 7 of ETAG 004 and shall be done in accordance with national instructions. This ETA covers application of ETICS where the concrete for testing of bond strength is representative for masonry or concrete.

The provisions made in this ETA are based on an assumed working life of 25 years as minimum, 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.

The technical documentation of this European Technical Assessment is deposited at the *Instituto de Ciencias de la Construcción Eduardo Torroja* (IETcc) and, as far as relevant for the tasks of the approved bodies involved in the attestation of conformity procedure, is handed over to the approved bodies.

EN 13162:2008. Thermal insulation products for buildings - Factory made mineral wool (MW) products – Specification.

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. The requirements given in ETAG 004, chapter 7 have to be considered.

<u>Design</u>. 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,.) 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 40 % for EPS and 80% for MW. Besides, the numbers of fasteners used with MW must comply with the National requirements.

<u>Execution</u>. 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 Chapter 7 of the ETAG. 004, with imperative removal of any existing paint finish or renders which may difficult the bond resistance of the system and 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 Essential Requirements were carried out in compliance with the ETA Guidance n. 004: External Thermal Insulation Composite Systems with Rendering- edition February 2013 (called ETAG 004, in this ETA).

## 3.1 ETICS Characteristics

Mechanical resistance and stability (BWR 1). No relevant.

<u>Safety in case of fire</u> ((BWR 2). **Reaction to fire.** Euroclass according to EN 13501-1:2002: A2-s1, d0 with MW (160mm thickness) and B-s2, d0 with EPS (100mm thickness).

Hygiene, health and environment (BWR 3)

#### Water absorption

Base Coat	Rendering	Water absorption (kg/m²)	
Dase Coat	Kendering	After 1h	After 24h
	without rendering RIVATONE PLUS G12 TERMOK8® IVAS RIVATONE PLUS G15		
TERMOK8® IVAS			
(4mm thickness) with the following	RIVATONE IDROSILICONICO PLUS G12	< 1,0	< 0,5
IVAS top coat	RIVATONE IDROSILICONICO PLUS G15		
	RIVATONE PLUS TRV G12		
	RIVATONE PLUS TRV G15		

**Hydrothermal behaviour**. It has been assessed on two rigs. During heat rain and heat – cold cycles, none of the following defects occurs during testing:

- Blistering or peeling of any finishing.
- Failure or cracking associated with joints between insulation product boards or profiles fitted with system.
- Detachment of render and cracking allowing water penetration to the insulation layer.

This system is therefore assessed as resistant to hydrothermal cycles.

**Freeze / thaw behaviour.** The water absorption of the base coat and of rendering system is less than 0.5 kg/m<sup>2</sup> after 24 hours and so the system can be assessed as freeze/thaw resistant without any further testing.

**Impact resistance**. The resistance to hard body impacts (3 and 10 Joules) tests carried out on samples of systems compositions lead to the following categories:

Rendering system base coat + finishing coat on MW	Standard : ARMATEX C1	Reinforced: ARMATEX C1 "R"
RIVATONE PLUS G12		
RIVATONE PLUS G15		Cotogony
RIVATONE IDROSILICONICO PLUS G12	Catagory II	Category I
RIVATONE IDROSILICONICO PLUS G15	Category II	
RIVATONE PLUS TRV G12		NPA
RIVATONE PLUS TRV G15		INFA

Rendering system base coat + finishing coat on EPS	Standard : ARMATEX C1	Reinforced: ARMATEX C1 "R"
RIVATONE PLUS G12		
RIVATONE PLUS G15	Cotogony II	
RIVATONE IDROSILICONICO PLUS G12	Category II	NPA
RIVATONE IDROSILICONICO PLUS G15		INFA
RIVATONE PLUS TRV G12	NPA	
RIVATONE PLUS TRV G15	INFA	

## Water vapour permeability

Rendering system: base coat (4 mm) + finishing coat	Equivalent air thickness (≤ 1 m)
RIVATONE PLUS G12	0,4
RIVATONE PLUS G15	0,4
RIVATONE IDROSILICONICO PLUS G12	0,2
RIVATONE IDROSILICONICO PLUS G15	0,2
RIVATONE PLUS TRV G12	0,8
RIVATONE PLUS TRV G15	0,8

**Dangerous substances**. This system complies with the provisions of Guidance Paper H<sup>(3)</sup>. 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 the EU Regulations 305/11, these requirements need also to be complied with, when and where apply.

### Safety in use (BWR 4)

**Bond strength: Base coat onto insulation board.** The tests were performed on samples of insulation boards faced with base coat, and were subjected to the following tests, and in all cases breakage location was 100% on MW and EPS:

Base coat onto insulation board (MPa)					
Thermal insulation	Thermal insulation   Initial state   After hydrothermal cycles (on the rigs)   After free/thaw cycles (on the samples)				
EPS	≥ 0,08	≥ 0,08	≥ 0,08		
MW	0,01	0,01	0,01		

**Bond strength: Adhesive onto insulation board.** The tests were performed on samples of insulation boards faced with base coat, and were subjected to the following tests, and in all cases breakage location was 100% on MW and EPS:

Base coat onto insulation board (MPa)						
Thermal insulation Initial state Immersion 48 h and 2 h drying Immersion 48 h and 7 d drying						
EPS	≥ 0,08	≥ 0,03	≥ 0,08			
MW	0,01	0,01	0,01			

## Bond strength: Adhesive onto concrete

Bond Strength results on concrete (MPa)					
Initial state Immersion 48 h and 2 h drying Immersion 48 h and 7 d drying					
≥ 0,25 ≥ 0,08 ≥ 0,25					

#### Pull-through of the fasteners

Fastener	Values	In the middle	
rastellel	(N/ fastener)	Dry condition	Wet condition
Tassello H1, Tassello H3, Tassello CT 2G +	Minimal	223	147
Rondella per lana di roccia	Mean	259	170

<sup>(3)</sup> Guidance Document H: "A harmonized approach related to dangerous substances under the Construction Products Directive".

The mineral wool used in the test has 6 cm of thickness. The test results are also valid for Insulation product of the same type with  $\geq$  thickness and/or  $\geq$  tensile strength perpendicular to the faces and Anchors with the  $\geq$  60 mm plate diameter + 90m of washer and/or the  $\geq$  plate Stiffness 0,6 kN/mm<sup>2</sup> (see EOTA Technical Report n° 26).

Displacement test of the fasteners. NPA since the bonded area exceeds 20 %

Protection against noise (BWR 5). NPA

Energy economy and heat retention (BWR 6)

**Thermal resistance**. The additional thermal resistance  $R_{\text{ETICS}}$  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  $R_{\text{render}}$  which is about 0.02 m<sup>2</sup>K/W.

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

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:

$$U_c = U + \Delta U (W/m^2K)$$
,

Uc: Corrected thermal transmittance (W/(m².K)) of the entire wall,, including thermal bridges.

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

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

Ri: thermal resistance of the insulation product // R<sub>render</sub>:thermal resistance of the render (about 0,02 (m².K)/W).

 $R_{substrate}$ : thermal resistance of the substrate of the building (concrete,brick...)((m<sup>2</sup>.K)/W) //

 $R_{se}$ : external superficial thermal resistance ((m<sup>2</sup>.K)/W). //  $R_{si}$ : internal superficial thermal resistance ((m<sup>2</sup>.K)/W).

ΔU: Correction term of the thermal transmittance for mechanical fixing devices

$$\Delta U = X_p \cdot n$$
,

n: number of anchors (through insulation product) per m² // X<sub>p</sub>: point thermal transmittance value of the anchor (0.002 W/K).

## Aspect of durability and serviceability

Bond strength after ageing. In all cases, breakage location was 100% on MW and IVAS EPS PANELS.

	MW insul	ation	EPS insulation
Rendering system (base coat + finishing coat)	After Hydrothermal cycles (rigs)	After 7 days immersion water	After Hydrothermal cycles (rigs)
RIVATONE PLUS G12			
RIVATONE PLUS G15	0.01 MPa		0.08 MPa
RIVATONE IDROSILICONICO PLUS G12	U,UT MFA		U,UO IVIFA
RIVATONE IDROSILICONICO PLUS G15			
RIVATONE PLUS TRV G12		0.01 MPa	
RIVATONE PLUS TRV G15	7	U,UT MPa	<del></del>

#### **3.2** Characteristics of the components

Detailed information on the chemical composition and other identifying characteristics of the components, following Annex C of ETAG 004, has been deposited at the IETcc. Further information can be observed from the product data sheets, which are part of the Technical Documentation for this ETA.

**Fasteners.** Fastener with CE marking according to ETAG 014.

Fasteners	ETA nº	Diameter Plate (mm)	Stiffness (kN/mm²)
TASSELLO H1	11/0192	60 +90 washer	0,6
TASSELLO H3	14/0130	60 +90 washer	0,6
TASSELLO CT 2G	04/0023	60 +90 washer	0,6

Glass fibre mesh. Tearing strength after ageing of the glass fibre mesh was tested according ETAG 004:

Status	Units	Standard		Reinforced	
Status	Ullits	Warp direction (L)	Weft direction (T)	Warp direction (L)	Weft direction (T)
Initial	N / mm (≥ 20)	≥ 20		≥ 20	
After ageing	N / mm (≥ 20)	≥ 20		≥ 2	0
Difference	%	≤ 50		≤ 6	0

Render. Render strip tensile resistance:

Samples	Warp		Weft	
	Nº fissures	Average width (mm)	Nº fissures	Average width (mm)
Average	9	0,12	9	0,15

**Insulation product.** ISOVER CLIMA 34 factory – prefabricated, uncoated boards made of mineral wool (MW, EN13162), manufactured by Saint-Gobain ISOVER Italia S.p.A and **IVAS PANEL EPS** (EN 13163), having the description, characteristics and performances (as minimum) defined in the table below:

Characteristics	Procedure	MW	EPS
Reaction to fire (euroclass)	EN 13501	A2-s1,d0	E
Length (mm)	EN 822	1200	L2
Width (mm)	EN 822	600	W2
Thickness (mm)	EN 823	T5	T1
Squareness (mm/m)	EN 824	≤ 5 mm/m	S2
Flatness (mm/m)	EN 825	≤ 6 mm/m	P3
Compression strength (kPa) at 10% deformation	EN 826	0,025 CS(10) >15	
Thermal conductivity (declared value) □ <sub>D</sub> at 10 °C (W/m.K)	EN 12667 /12939	Defined at	CE
Dimensional stability (%) under specific conditions of temperature and humidity	EN 1604	≤ 1%	≤ 0,7%
Tensile strength perpendicular to the faces in dry conditions (N/mm²)	EN 1607	TR≥7.5	TR≥ 10
Water absorption (kg/m²) (partial immersion)	EN 1609	≤1	≤ 1
Water vapour diffusion	EN 12086	$\mu = 1$	$\mu = 40$
Shear strength (N/mm²)	EN 12090	≥ 0,02	≥ 0,02
Shear modulus (N/mm²)	EN 12090	≥ 1	≥ 1

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

**System of attestation of conformity**. According to the decision 97/556/EC of the European Commission <sup>(4)</sup> amended by 2001/596/EC<sup>(5)</sup> the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) no 305/2011) given in the following table applies.

Product	Product Intended uses		System
TERMOK8® IVAS	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:

<u>Tasks for the manufacturer</u>: Initial type-testing of the product, 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.
- o Continuous surveillance (annual), assessment and assessment of factory production control.

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

The ETA is issued for this kit on the basis of agreed data/information, deposited at IETcc, 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 specific conditions according to sections 1, 2, 4 and 5 including the annexes of this ETA. Changes to the ETICS or the components or their production process, should be notified to the IETcc before the changes are introduced. IETcc will decide whether or not such changes affect the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

#### **5.1** Tasks of 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 including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before

<sup>(4)</sup> Official Journal of the European Communities L229/14 of 20.08.1997

<sup>(5)</sup> Official Journal of the European Communities L209/33 of 02.08.2001

acceptance. 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.

The factory production control shall be in accordance with the Control Plan<sup>(6)</sup> which is part of the Technical Documentation of this ETA. The Control Plan has been agreed between the manufacturer and the IETcc and is laid down in the context of the factory production control system operated by the manufacturer and deposited at the IETcc. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

**Initial type-testing of the product**. Initial type-testing carried out by the IETcc is that set out in chapter 5 of the guideline for External Thermal Insulation Composite System with rendering for use on building walls (ETAG 004). The IETcc assessed the results of these tests in accordance with chapter 6 of this Guide, as part of the ETA issuing procedure.

If the verifications underlying this ETA have been furnished on samples from the current production, these will replace the initial type-testing. Otherwise the necessary initial type-testing shall be carried out according to the provisions of the test plan and observance of the required property values shall be ascertained by the notified body. After changing the production process or starting the production in another manufacturing plant the initial type-test shall be repeated.

Other tasks of 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 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 bodies involved.

For initial type - testing of 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 initial type- testing has to be agreed with the IETcc.

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

#### **5.2** Tasks of notified bodies. The notified body shall perform:

**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 assessment of factory production control, in accordance with the provisions laid down in the control plan, at least one per year.

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 an EC 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 without delay.

<sup>(6)</sup> The control plan is a confidential part of this European Technical Assessment and only handed over to the notified body involved in the procedure of attestation of conformity. See section 3.2.2.

# Issued in Madrid on 20/ 06/ 2018 by



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