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European Technical Assessment - ETA 07/0280 of 22/01/2018

(English language translation prepared by ITC CNR; original version in Italian)

GENERAL PART

Trade name of the construction product

“FASSATHERM CLASSIC”

Product family to which the construction product belongs

**PAC 04: THERMAL INSULATION PRODUCTS.
COMPOSITE INSULATING KITS/SYSTEMS.
External Thermal Insulation Composite System
with renderings for the use as external insulation
to the walls of building**

Manufacturer

**Fassa S.r.l
via Lazzaris, 3
I - 31027 Spresiano (TV) - Italy**

Manufacturing plant

**Fassa S.r.l.
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This European Technical Assessment contains

23 pages

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ETAG 004 Edition 2013, used as EAD (European Assessment Document)

This European Technical Assessment replaces

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SPECIFIC PARTS

1. TECHNICAL DESCRIPTION OF THE PRODUCT

The kit "FASSATHERM CLASSIC" is designed and installed in accordance with the ETA Holder design and installation instructions, deposited at ITC-CNR.

According to categories envisaged by § 2.2 of ETAG 004 used as EAD, the kit "FASSATHERM CLASSIC" may be installed either as a bonded ETICS (required bonded surface: at least 50%) with supplementary mechanical fixings (the fixings are used to provide stability until the adhesive has dried and act as a temporary connection), or as mechanically fixed ETICS with supplementary adhesive (the adhesive is used to ensure the flatness of the installed system); it comprises the components described in the following Table 1 which are factory-made by the ETA Holder or by his suppliers. The ETA Holder is ultimately responsible for the kit.

1.1 Components of the kit "FASSATHERM CLASSIC"

The components of the kit are specified by the ETA Holder as follows:

Components	Trade name	Installation information	
		Coverage kg/m²	Thickness
Insulation material with associated method of fixing	Bonded ETICS		
	Insulation product 1 "EPS 120" (expanded polystyrene panels)	//	min: 30 mm max: 300 mm
	Insulation product 2 "EPS con grafite" (expanded polystyrene panels with addition of graphite)	//	min: 30 mm max: 300 mm
	Insulation product 3 "EPS 80" (expanded polystyrene panels)	//	min: 30 mm max: 300 mm
	Insulation product 4 "EPS100" (expanded polystyrene panels)	//	min: 30 mm max: 300 mm
	Insulation product 5 "Colorex" (expanded polystyrene panels with addition of graphite)	//	min: 30 mm max: 300 mm
	Adhesive 1 "A50" (cement ¹ based powder paste requiring addition of 22-24 % of water); particle size: 0.6 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//
	Adhesive 2 "A96" (cement ² based powder paste requiring addition of 25- 27 % of water); particle size: 1.2 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//
	Adhesive 3 "AL88" (cement ³ based powder paste requiring addition of 30-34 % of water); particle size:1.2 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//

¹ CEM I 52,5 R

² CEM I 52,5 R

³ CEM I 52,5 R

Mechanically fixed ETICS with supplementary adhesive			
	Insulation product 1 "EPS 120" (expanded polystyrene panels)	//	min: 60 mm max: 300 mm
	Insulation product 2 "EPS con grafite" (expanded polystyrene panels with addition of graphite)	//	min: 60 mm max: 300 mm
	Insulation product 3 "EPS 80" (expanded polystyrene panels)	//	min: 60 mm max: 300 mm
	Insulation product 4 "EPS100" (expanded polystyrene panels)	//	min: 60 mm max: 300 mm
	Insulation product 5 "Colorex" (expanded polystyrene panels with addition of graphite)	//	min: 60 mm max: 300 mm
	Adhesive 1 "A50" (cement ⁴ based powder paste requiring addition of 22-24 % of water); particle size: 0.6 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//
	Adhesive 2 "A96" (cement ⁵ based powder paste requiring addition of 25- 27 % of water); particle size: 1.2 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//
	Adhesive 3 "AL88" (cement ⁶ based powder paste requiring addition of 30-34 % of water); particle size:1.2 mm	all the surface: 3.0 - 5.0 points: 3.0 - 4.0	//
	Anchor "FASSA TOP FIX" Screwed-in anchor with a plastic plate and a screw made of stainless steel or galvanised steel	//	Ø of the collar: 60 mm Ø of the screw: 8 mm
	Anchor "TELE FIX" Nailed-in anchor with a plastic plate and a plastic nail	//	Ø of the collar: 60 mm Ø of the nail: 8 mm
	Anchor "FASSA IRON FIX" Nailed-in anchor with a stainless steel nail or galvanized steel nail	//	Ø of the collar: 60 mm Ø of the nail: 8 mm
Base coats	Base coat 1 "A50" (cement ⁷ based powder paste requiring addition of 22-24 % of water); particle size: 0.6 mm	5 - 6	3.0 - 5.0 mm

⁴ CEM I 52,5 R

⁵ CEM I 52,5 R

⁶ CEM I 52,5 R

⁷ CEM I 52,5 R

	Base coat 2 “A96” (cement ⁸ based powder paste requiring addition of 25- 27 % of water); particle size: 1.2 mm	6 - 7	4.0 - 5.0 mm
	Base coat 3 “AL88” (cement ⁹ based powder paste requiring addition of 30-34 % of water); particle size:1.2 mm	5 - 6	4.0 - 5.0 mm
Reinforcement	Glass fibre mesh “Fassanet 160” (mesh size: 3.4 x 4.3 mm)	//	//
Key coats	Key coat 1 “FA 249” (Watery solution of acrylic resins)	0.03-0.05 l/m ²	100 -120 μ
	Key coat 2 “FS 412” (Watery solution of acril-silicon resins)	0.10-0.15 l/m ²	100 -120 μ
	Key coat 3 “F 328” (Watery solution of potassium silicate and acrylic resins)	0.10-0.15 l/m ²	100 -120 μ
	Key coat 4 “FX526” (Watery solution of acril-silicon resins)	0.10-0.15 l/m ²	100 -120 μ
Finishing coats	Finishing coat 1 “RTA 549” (ready to use paste based on acrylic resin) particle size: 1.0, 1.5, 2.0, 3.0 mm	2 - 4 (prepared product)	1.0 - 3.0 mm
	Finishing coat 2 “RSR 421” (ready to use paste based on acril-silicon resin) particle size: 1.0, 1.5, 2.0, 3.0 mm	2 - 4 (prepared product)	1.0 - 3.0 mm
	Finishing coat 3 “R 336” (ready to use paste based on potassium silicate and acril resins); particle size: 1.0, 1.5, 2.0, 3.0 mm	2 - 4 (prepared product)	1.0 - 3.0 mm
	Finishing coat 4 “RX 561” (ready to use paste based on acril-silicon resin) particle size: 1.0, 1.5, 2.0, 3.0 mm)	2 - 4 (prepared product)	1.0 - 3.0 mm
Ancillary materials	Base profiles in aluminium: “Profilo di partenza con gocciolatoio” U profiles (length 250 cm - different sections)	//	1
	Corner profiles in aluminium: “Paraspigolo” L profiles (length 250 cm – different sections)	//	1

Tab. 1: Components of the kit

⁸ CEM I 52,5 R

⁹ CEM I 52,5 R

2. SPECIFICATION OF THE INTENDED USE IN ACCORDANCE WITH ETAG 004 USED AS EUROPEAN ASSESSMENT DOCUMENT

“FASSATHERM CLASSIC” is intended for use as external thermal insulation composite system of buildings’ walls and in particular for new and existing buildings whose facades can be made of masonry (bricks, concrete, stones, ...), in concrete cast on site or in prefabricated panels, or can be rendered and coated or uncoated; the substrate may need preparation as described in § 7.2.1 of ETAG 004.

The kit can be used on vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation. It is made of non load-bearing construction elements and the installed system does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effects of weathering. The installed system is not intended to ensure the air tightness of the building structure. For what concerns the impact resistance, some alternatives of the system result in Use Category I while other alternatives result in Category II (see § 2.2.5 of this ETA for details).

The provisions made in this ETA are based on an assumed intended working life of at least 25 years, provided that the conditions laid down in section 4.2, 5.1, 5.2 of this ETA for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or by the Assessment Body, but should only be regarded as a mean for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

2.1 Manufacturing

The “FASSATHERM CLASSIC” components shall correspond, as far as their composition and manufacturing process is concerned, to the products subject to the assessment tests. Manufacturing process scheme is deposited with ITC-CNR.

2.2 Installation

2.2.1. General

It is the responsibility of the ETA Holder to guarantee that the information about design and installation of the system “FASSATHERM CLASSIC” are effectively communicated to the concerned people. These information can be given using reproductions of the respective parts of this European Technical Assessment. Besides, all the data concerning the execution shall be indicated clearly on the packaging and/or the enclosed instruction sheets using one or several illustrations. In any case, it is suitable to comply with national regulations and particularly concerning fire.

Only the components described in clause 1.1 with characteristics in accordance with clause 2 of this ETA can be used for the system “FASSATHERM CLASSIC”. The requirements given in ETAG 004, used as EAD, chapter 7, have to be considered.

2.2.2. Design

To bond the system, the minimal bonded surface area and the method of bonding shall comply with characteristics of the system “FASSATHERM CLASSIC” as well as the national regulations. In any case, the minimal bonded surface shall be at least 50%.

2.2.3. Execution

The recognition and preparation of the substrate as well as the generalities about the execution of the system “FASSATHERM CLASSIC”, which are fully described in the current version of the ETA Holder Catalogue, shall be carried out in compliance with:

- chapter 7 of the ETAG 004, used as EAD;
- national regulations in effect, if any.

The particularities in execution linked to the method of bonding and the application of the rendering system shall be handled in accordance with ETA Holder prescriptions. In

particular it is suitable to comply with the quantities of rendering applied, the thickness regularity and the drying period between 2 layers.

2.3 Packaging, transport and storage

Packaging of the components has to be such that the products are protected from moisture during transport and storage, unless other measures are foreseen by the manufacturer for this purpose and, in case, by ETA Holder specifications.
The components have to be protected against damage.

2.4 Maintenance and repair of the works

It is accepted that the finishing coat shall normally be maintained in order to fully preserve the system's performances.

Maintenance, which is clearly described in the current version of the ETA Holder Catalogue, includes:

- 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. CHARACTERISTICS OF PRODUCTS AND METHODS OF VERIFICATION

The tests for the assessment of the performances of "FASSATHERM CLASSIC" were carried out according to the tests mentioned in ETAG 004, used as EAD; the performances are valid only if the kit's components are exactly the ones mentioned at § 1 of this ETA.

3.1 Reaction to fire of "FASSATHERM CLASSIC"

The reaction to fire has been determined according with § 5.1.2.1 of ETAG 004 for the alternatives mentioned in the following tables 2, 3, 4, 5, with the components defined under clause 1.1, and according to EN 13501-1, they reached the following Euroclass:

Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat FA249 + finishing coat RTA549, according to EN 13501-1:

	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
FASSATHERM CLASSIC	base coat: 5% finishing coat: 9.4%	0	200	B – s2, d0

Tab. 2: Reaction to fire

Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat FA249 + finishing coat RTA549, according to EN 13501-1:

	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
FASSATHERM CLASSIC	base coat: 5% finishing coat: 9.4%	0	200	B – s2, d0

Tab. 3: Reaction to fire

Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat FA249 + finishing coat RTA549, according to EN 13501-1:

	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
FASSATHERM CLASSIC	base coat: 6% finishing coat: 9.4%	0	200	B – s2, d0

Tab. 4: Reaction to fire

Alternative with adhesive AL88 + EPS 120 + base coat AL88 + key coat FA249 + finishing coat RTA549, according to EN 13501-1:

	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
FASSATHERM CLASSIC	base coat: 5% finishing coat: 9.4%	0	200	B – s2, d0

Tab. 5: Reaction to fire

Mounting and fixing

(for all end use applications given in clause 2 of this ETA)

The assessment of reaction to fire is based on tests with a maximum insulation layer thickness of SBI/200 mm, EN 11925-2/60 mm and a maximum insulation material (EPS) density of 20.00 kg/m³, as well as a rendering system with a maximum organic content of 14.4 - 15.4% and a thickness of 4.0 mm. For the SBI test the system was mounted directly to a calcium silicate substrate (A2-s1, d0) with a minimum density of 815 kg/m³.

The mounting of the specimen was carried out at ITC-CNR Laboratory by the Manufacturer following the specifications given in his ETA Technical Dossier and in his Recommendations, using a single layer of the glass fibre mesh all over the specimen (without overlapping the mesh). The specimen didn't include any joints nor anchors (anchors have no influence on the test results); the panel edges were rendered, excluding the bottom edge and the top of the specimen.

Extended application

According to EN 13501-1, the test results (Tables 2, 3, 4) cover arrangements with insulation materials (EPS) of a lower thickness and density, as well as with rendering systems (binder types) with a lower organic content. That means that the following configurations:

- Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat FS412 + finishing coat RSR421,
- Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat F328 + finishing coat R336,
- Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat FX526 + finishing coat RX561,
- Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat FS412 + finishing coat RSR421,
- Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat F328 + finishing coat R336,
- Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat FX526 + finishing coat RX561.
- Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat FS412 + finishing coat RSR421,
- Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat F328 + finishing coat R336,
- Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat FX526 + finishing coat RX561,

fall into the Classification of fire reaction mentioned in Tab. 6.

	Organic content of the rendering system (%)	Flame retardant content of the rendering system (%)	Maximum thickness (mm)	Class
FASSATHERM CLASSIC in the following alternative: - Alternative with adhesive A96 + EPS 120 + base coat	base coat: 6% finishing coat: 9.4%	0	200	B – s2, d0

<p>A96 + key coat FS412 + finishing coat RSR421, - Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat F328 + finishing coat R336, - Alternative with adhesive A96 + EPS 120 + base coat A96 + key coat FX526 + finishing coat RX561, Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat FS412 + finishing coat RSR421, - Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat F328 + finishing coat R336, - Alternative with adhesive A96 + EPS con grafite + base coat A96 + key coat FX526 + finishing coat RX561. - Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat FS412 + finishing coat RSR421, - Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat F328 + finishing coat R336, - Alternative with adhesive A50 + EPS con grafite + base coat A50 + key coat FX526 + finishing coat RX561. Alternative with adhesive AL88 + EPS 120 + base coat AL88 + key coat FA249 + finishing coat RTA549.</p>				
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Tab. 6: Extended application of the classification of Reaction to fire

For all other alternatives, the reaction to fire was not determined and then, according to EN 13501-1 the Euroclass is F.
Euroclass F: No Performance Determined.

3.2 Hygiene, health and the environment

3.2.1 Water absorption (capillarity test)

The water absorption has been determined in accordance with § 5.1.3.1 of ETAG 004.

Water absorption	after 1 hour		after 24 hours	
	< 1.0 kg/m ²	≥ 1.0 kg/m ²	< 0.5 kg/m ²	≥ 0.5 kg/m ²
Base coat "A 50"	X	not applicable	X	
Rendering system made of: - base coat "A 50" - key coat "FA 249" - finishing coat "RTA 549"	X	not applicable	X	
Rendering system made of: - base coat "A 50" - key coat "FS 412" - finishing coat "RSR 421"	X	not applicable	X	
Rendering system made of: - base coat "A 50" - key coat "F 328" - finishing coat "R 336"	X	not applicable	X	
Rendering system made of: - base coat "A 50" - key coat "FX 526" - finishing coat "RX 561"	X	not applicable	X	
Base coat "A 96"	X	not applicable	X	
Rendering system made of: - base coat "A 96" - key coat "FA 249" - finishing coat "RTA 549"	X	not applicable	X	
Rendering system made of: - base coat "A 96" - key coat "FS 412" - finishing coat "RSR 421"	X	not applicable	X	
Rendering system made of: - base coat "A 96" - key coat "F 328" - finishing coat "R 336"	X	not applicable	X	
Rendering system made of: - base coat "A 96" - key coat "FX 526" - finishing coat "RX 561"	X	not applicable	X	
Base coat "AL 88"	X	not applicable		X
Rendering system made of: - base coat "AL 88" - key coat "FA 249" - finishing coat "RTA 549"	X	not applicable	X	
Rendering system made of: - base coat "AL 88" - key coat "FS 412" - finishing coat "RSR 421"	X	not applicable	X	
Rendering system made of: - base coat "AL 88" - key coat "F 328" - finishing coat "R 336"	X	not applicable	X	

Rendering system made of: - base coat "AL 88" - key coat "FX 526" - finishing coat "RX 561"	X	not applicable	X	
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Tab. 7: Water absorption

3.2.2 Hygrothermal behaviour (heat-rain and heat-cold cycles)

In accordance with the method envisaged in 5.1.3.2.1 ETAG 004, the kit has been applied on rigs and the hygrothermal behaviour of the different alternatives has been assessed.

None of the following defects occurred:

- blistering or peeling of any paint finishing,
- failure or cracking associated with joints between insulation products boards or profiles fitted with the system,
- detachment of the render,
- cracking allowing water penetration to the insulation layer.

Assessment: the system "FASSATHERM CLASSIC" is resistant to hygrothermal cycles.

3.2.3 Freeze-thaw performance

As shown in Tables 7 of this ETA, the water absorption of the base coat A 50, of the base coat A 96 and of the rendering systems including these base coats were less than 0.5 kg/m² after 24 hours and so the related alternatives of "FASSATHERM CLASSIC" can be assessed as freeze/thaw resistant without any further testing.

The water absorption of the base coat AL 88 resulted more than 0.5 kg/m² after 24 hours and so the alternatives of the system including this base coat were submitted to the freeze-thaw cycles as envisaged from clause 5.1.3.2.2 of ETAG 004 (simulated method).

The samples were submitted to 30 cycles of freeze-thaw. Every 3 cycles observations were made on possible changes in the characteristics of the surface and of the system. No changes nor distortions of the edges were observed.

Then "FASSATHERM CLASSIC" can be considered freeze-thaw resistant also in the alternatives that include the base coat AL 88.

3.2.4 Impact resistance

The tests have been performed on the rig on the 18 alternatives after the hygrothermal cycles, in accordance with § 5.1.3.3 of ETAG 004. The system was made both with one single standard mesh or with double layer mesh. The resistance of the system to hard body impacts (3 Joules and 10 Joules) and to perforation (Perfotest) leads to the following use categories:

"FASSATHERM CLASSIC" with one single standard mesh

"FASSATHERM CLASSIC" with finishing coat RTA 549 - Single standard mesh	Use Category I
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Tab. 8a: Category of impact resistance of "FASSATHERM CLASSIC" with finishing coat RTA 549

"FASSATHERM CLASSIC" with other finishing coats RSR 421, R 336 and RX 561- Single standard mesh	Use Category II
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Tab. 8b: Category of impact resistance of "FASSATHERM CLASSIC" with finishing coats RSR 421, R 336 and RX 561

Alternatives of "FASSATHERM CLASSIC" in Category I with 2 layers of mesh

<i>Alternative</i>	<i>Use Category</i>
Base coat A 50 + 2 layers of mesh + finishing coat R 336 on insulation EPS 120	Use Category I

Base coat A 50 + 2 layers of mesh + finishing coat RSR 421 on insulation EPS 120	Use Category I
Base coat A 50 + 2 layers of mesh finishing coat R 336 on insulation EPS con grafite	Use Category I
Base coat A 50 + 2 layers of mesh + finishing coat RSR 421 on insulation EPS con grafite	Use Category I
Base coat AL 88 + 2 layers of mesh + finishing coat RTA 549 on insulation EPS 120	Use Category I
Base coat AL 88 + 2 layers of mesh + finishing coat RSR 421 on insulation EPS con grafite	Use Category I
Base coat AL 88 + 2 layers of mesh + finishing coat RTA 549 on insulation EPS con grafite	Use Category I
Base coat A 96 + 2 layers of mesh + finishing coat RSR 421 on insulation EPS 120	Use Category I
Base coat A 96 + 2 layers of mesh + finishing coat RTA 549 on insulation EPS 120	Use Category I
Base coat A 96 + 2 layers of mesh + finishing coat R 336 on insulation EPS con grafite	Use Category I
Base coat A 96 + 2 layers of mesh + finishing coat RSR 421 on insulation EPS con grafite	Use Category I
base coat A 96 + 2 layers of mesh + finishing coat RTA 549 on insulation EPS con grafite	Use Category I

Tab. 8c: Category of impact resistance of some alternatives of the "FASSATHERM CLASSIC" with 2 layers of mesh

3.2.5 Water vapour permeability (Resistance to water vapour diffusion)

The water vapour permeability has been determined in accordance with § 5.1.3.4 of ETAG 004. The finishing coat "R 336", which is not purely polymeric, has been tested in the particle size 1 mm.

Alternatives with base coat "A 50"

Water vapour permeability	Acceptance criteria (m)	Equivalent air thickness (m)	Pass
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.0 mm)	≤ 2.0	0.445	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.5 mm)	≤ 2.0	0.461	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (2.0 mm)	≤ 2.0	0.537	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (3.0 mm)	≤ 2.0	0.561	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.0 mm)	≤ 2.0	0.406	X

Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.5 mm)	≤ 2.0	0.433	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (2.0 mm)	≤ 2.0	0.434	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (3.0 mm)	≤ 2.0	0.508	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "F 238" - finishing coat "R 336" (3.0 mm)	≤ 2.0	0.326	X
Rendering system made of: - base coat "A 50" (3.0 mm) - key coat "FX 526" - finishing coat "RX 561" (3.0 mm)	≤ 2.0	0.700	X

Tab. 9a: Water vapour permeability in the alternatives with base coat "A 50"

Alternatives with base coat "A 96"

Water vapour permeability	Acceptance criteria (m)	Equivalent air thickness (m)	Pass
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.0 mm)	≤ 2.0	0.299	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.5 mm)	≤ 2.0	0.333	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (2.0 mm)	≤ 2.0	0.416	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (3.0 mm)	≤ 2.0	0.421	X
Rendering system made of: - base coat "A 96" (4 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.0 mm)	≤ 2.0	0.290	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.5 mm)	≤ 2.0	0.281	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (2.0 mm)	≤ 2.0	0.325	X

Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (3.0 mm)	≤ 2.0	0.410	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "F 238" - finishing coat "R 336" (3.0 mm)	≤ 2.0	0.215	X
Rendering system made of: - base coat "A 96" (4.0 mm) - key coat "FX 526" - finishing coat "RX 561" (3.0 mm)	≤ 2.0	0.480	X

Tab. 9b: Water vapour permeability in the alternatives with base coat "A 96"

Alternatives with base coat "AL 88"

Water vapour permeability	Acceptance criteria (m)	Equivalent air thickness (m)	Pass
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.0 mm)	≤ 2.0	0.293	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (1.5 mm)	≤ 2.0	0.311	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (2.0 mm)	≤ 2.0	0.395	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FA 249" - finishing coat "RTA 549" (3.0 mm)	≤ 2.0	0.411	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.0 mm)	≤ 2.0	0.261	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (1.5 mm)	≤ 2.0	0.289	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (2.0 mm)	≤ 2.0	0.289	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FS 412" - finishing coat "RSR 421" (3.0 mm)	≤ 2.0	0.355	X
Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "F 238" - finishing coat "R 336" (3.0 mm)	≤ 2.0	0.178	X

Rendering system made of: - base coat "AL 88" (4.0 mm) - key coat "FX 526" - finishing coat "RX 561" (3.0 mm)	≤ 2.0	0.500	X
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Tab.9c: Water vapour permeability in the alternatives with base coat "AL 88"

3.2.6 Release of dangerous substances

(in accordance with § 5.1.3.5 of ETAG 004, and with EOTA TR 034)

The external thermal insulation composite system neither contains nor releases the dangerous substances specified in EOTA TR 034 (March 2012).

A written declaration in this respect was made by the manufacturer. In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products 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 Construction Products regulation 305/2011, these requirements need also to be complied with, when and where they apply.

3.2.7 Safety in use

3.2.7.1 Bond strength

The bond strength has been determined in accordance with § 5.1.4.1 of ETAG004.

"A 50"

Bond strength between:	Acceptance criteria	Pass
base coat "A 50" and insulation products (§ 5.1.4.1.1): - under dry conditions	≥ 0.08 MPa	X
adhesive "A 50" and substrate (concrete) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X
adhesive "A 50" and substrate (clay bricks) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X
adhesive "A 50" and insulation products (§ 5.1.4.1.3): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.08 MPa ≥ 0.03 MPa ≥ 0.08 MPa	X X X

Tab. 10a: Bond strength between "A 50" and different substrates

"A 96"

Bond strength between:	Acceptance criteria	Pass
base coat "A 96" and insulation products (§ 5.1.4.1.1): - under dry conditions	≥ 0.08 MPa	X
adhesive "A 96" and substrate (concrete) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X
adhesive "A 96" and substrate (clay bricks) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X

adhesive "A 96" and insulation products (§ 5.1.4.1.3):		
- under dry conditions	≥ 0.08 MPa	X
- 2 days of water immersion + 2 hours drying	≥ 0.03 MPa	X
- 2 days of water immersion + 7 days drying	≥ 0.08 MPa	X

Tab. 10b: Bond strength between "A 96" and different substrates

"AL 88"

Bond strength between:	Acceptance criteria	Pass
base coat "AL 88" and insulation products (§ 5.1.4.1.1): - under dry conditions	≥ 0.08 MPa	X
adhesive "AL 88" and substrate (concrete) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X
adhesive "AL 88" and substrate (clay bricks) (§ 5.1.4.1.2): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.25 MPa ≥ 0.08 MPa ≥ 0.25 MPa	X X X
adhesive "AL 88" and insulation products " (§ 5.1.4.1.3): - under dry conditions - 2 days of water immersion + 2 hours drying - 2 days of water immersion + 7 days drying	≥ 0.08 MPa ≥ 0.03 MPa ≥ 0.08 MPa	X X X

Tab. 10c: Bond strength between "AL 88" and different substrates

3.2.7.2 Fixing strength: displacement test

Test not required because the ETICS fulfils the following criteria:

$E \cdot d < 50\,000$ N/mm

where:

E: modulus of elasticity of the base coat without glass fibre mesh

d: mean dried thickness of the base coat

3.2.7.3 Fixing strength: Wind load resistance

Safety in use of mechanically fixed ETICS using anchors: FASSA TOP FIX (EJOT STR-U) ETA 04/0023; FASSA TELE FIX (EJOT NTK-U) ETA 07/0026; FASSA IRON FIX (EJOT NT-U) ETA 05/0009. The following failure loads only apply to the listed combination (EPS panel's characteristics) / (anchor plate's characteristics) and the characteristics of the insulation product given in clause 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5.

Apply to all anchors listed in Tab. 1 of this ETA mounted on the insulation panels surface			
Characteristics of the insulation product	Thickness (mm)		≥ 60 mm
	Tensile strength perpendicular to the face (kPa)		≥ 100 kPa
	Shear modulus		≥ 1.00 N/mm ²
Plate diameter (mm)			≥ 60
Failure loads (N)	Anchors not placed at the panel joints (Static Foam block test)	R_{panel}	Minimal: 510 Average: 520
	Anchors placed at the panel joints (Pull-through test)	R_{joint}	Minimal: 400 Average: 430

Tab. 11: Failure loads (N)

The failure loads specified above only apply to the following anchors with deep mounting under the given conditions of installation:

Anchor	Thickness of EPS [d]	Conditions of installation*
FASSA TOP FIX (Ejot STR U) (ETA-04/0023)	100 mm > d ≥ 80 mm (for standard EPS)	– Maximum installation depth of the anchor plate: 15 mm (~ thickness of insulation cover) – Maximum depth of die: 5 mm
	≥ 100 mm (for standard EPS)	– Maximum installation depth of the anchor plate: 15 mm (~ thickness of insulation cover) – Maximum depth of die: 20 mm

Tab. 12: Conditions of installation (* According to the appropriate ETA of anchor)

The wind load resistance of the ETICS R_d is calculated as follow:

$$R_d = (R_{\text{panel}} \times n_{\text{panel}} + R_{\text{joint}} \times n_{\text{joint}}) / \gamma$$

where:

- n_{panel} : number (per m²) of anchors not placed at the panel joint
 n_{joint} : number (per m²) of anchors placed at the panel joint
 γ : national safety factor

3.2.8 Thermal resistance

The additional thermal resistance provided by the ETICS (R_{ETICS}) to the substrate wall is calculated from the thermal resistance of the insulation product (R_D), determined in accordance with 5.2.6.1, and from the tabulated R_{render} value of the render system (R_{render} is about 0,02 m²K/W),

$$R_{\text{ETICS}} = R_D + R_{\text{render}} \text{ [(m}^2\text{×K)/W]}$$

as described in:

- EN ISO 6946: Building components and building elements - Thermal resistance and thermal transmittance - Calculation method.
- EN ISO 10456: Building materials and products - Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values.

If the thermal resistance cannot be calculated, it can be measured on the complete ETICS as described in:

EN 1934: "Thermal insulation - Determination of steady state thermal transmission properties - Calibrated and guarded hot box".

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:

$$U_c = U + \Delta U \text{ [W/(m}^2\text{×K)]}$$

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

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

$R_{\text{substrate}}$ thermal resistance of the substrate wall [(m²×K)/W]

R_{se} external surface thermal resistance [(m²×K)/W]

R_{si} internal surface thermal resistance [(m²×K)/W]

ΔU correction term of the thermal transmittance for mechanical fixing devices

$$= \chi_p \cdot n \text{ (for anchors)} + \sum \psi_i \cdot \ell_i \text{ (for profiles)}$$

- χ_p point thermal transmittance value of the anchor [W/K]. See Technical Report n°25. If not specified in the anchors 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.
 = 0.004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material
 = 0.008 W/K for all other anchors (worst case)

n number of anchors per m²

ψ_i linear thermal transmittance value of the profile [W/(m²K)]
 l_i length of the profile per m²

The influence of thermal bridges can also be calculated as described in: EN ISO 10211: Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations. It shall be calculated according to this standard if there are more than 16 anchors per m² foreseen. The cp-values given by the manufacturer do not apply in this case.

3.2.9 Aspects of durability: Bond strength after ageing

The bond strength of the system after ageing has been determined following the method envisaged in § 5.1.7.1.2 of ETAG 004.

Bond strength after ageing (7 days immersion + 7 days at (23 ± 2°C), (50 ± 5% RH)	Acceptance criteria	Pass
Bond strength between base coat "A 50" + finishing coat "RTA 549" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "A 50" + finishing coat "RSR 421" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "A 50" + finishing coat "R 336" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "A 96" + finishing coat "RTA 549" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "A 96" + finishing coat "RSR 421" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "A 96" + finishing coat "R 336" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "AL 88" + finishing coat "RTA 549" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "AL 88" + finishing coat "RSR 421" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "AL 88" + finishing coat "R 336" and insulation products	≥ 0.08 MPa	X
Bond strength between base coat "AL 88" + finishing coat "RX 561" and insulation product ¹⁰	≥ 0.08 MPa	X

Tab. 13: Bond strength after ageing

3.3 Component's characteristics and parameters

The tests on components have been carried out in accordance with § 5.2 and with Annex C of ETAG 004 in order to verify the declared values or with the acceptance values of ETAG 004, where present. The results were positive.

3.3.1 Insulation product "EPS 120"

Expanded polystyrene panels with right edges. Their characteristics are given in the following table.

<i>Characteristic (test method)</i>	<i>Declared value (classification, standard, reference)</i>	<i>Minimum/maximum value (when envisaged from ETAG 004)</i>	<i>Pass/fail or statement of the value (when envisaged from ETAG 004)</i>
Reaction to fire (EN 11925-2) thickness: 30 -140 mm density: 20 kg/m ³	Euroclass E (EN 13501-1)	-	-

¹⁰ The bond strength of the finishing coat RX 561 was determined only with the base coat AL 88 because it is the one with the lower bond strength and with the insulation Colorex because it is the one with the lower tensile strength

Water absorption by partial immersion (EN 1609) thickness: 40 mm density: 20 kg/m ³	-	≤ 1 kg/m ²	pass
Water vapour permeability (μ) (EN 12086) thickness: 40 mm	-	-	49.83
Tensile strength (EN 1607)	200 KPa (EN 13163)	-	-
Shear strength (EN 12090)	-	≥ 0.02 N/mm ²	pass
Shear modulus of elasticity (EN 12090)	-	≥ 1.00 N/mm ²	pass
Conductivity (λ) (EN 12667)	≤ 0.034 W/mK	-	-
Thermal resistance for the minimum thickness (30 mm) (EN 12667)	-	-	0.88 m ² K/W
Thickness (EN 823)	T2 (EN 13163)	-	-
Length (EN 822)	L2 (EN 13163)	-	-
Width (EN 822)	W2 (EN 13163)	-	-
Squareness (EN 824)	S2 (EN 13163)	-	-
Flatness (EN 825)	P4 (EN 13163)	-	-
Surface conditions	Cut surface	-	-
Density (EN 1602)	20 kg/m ³ (± 10%)	-	-
Dimensional stability (23° ± 2°C, 50 ± 5% RH) (EN 1603)	DS(N) 2 (EN 13163)	≤ 0.2 %	-
Dimensional stability (70° ± 2° C for 7 days) (EN 1604)	DS(70,-) 1 (EN 13163)	≤ 0.5 %	-

Tab. 14: Characteristics of Insulation product “EPS 120”

3.3.2 Insulation product “EPS con grafite”

Expanded Polystyrene panels with addition of graphite with right edges. Their characteristics are given in the following table.

<i>Characteristic (test method)</i>	<i>Declared value (classification, standard, reference)</i>	<i>Minimum/maximum value (when envisaged from ETAG 004)</i>	<i>Pass/fail or statement of the value (when envisaged from ETAG 004)</i>
Reaction to fire (EN 11925-2) thickness: 30 -140 mm density: 20 kg/m ³	Euroclass E (EN 13501-1)	-	-
Water absorption by partial immersion (EN 1609) thickness: 40 mm density: 20 kg/m ³	-	≤ 1 kg/m ²	pass
Water vapour permeability (μ) (EN 12086) thickness: 40 mm	-	-	40.71

Tensile strength (EN 1607)	150 KPa (EN 13163)	-	-
Shear strength (EN 12090)	-	$\geq 0.02 \text{ N/mm}^2$	pass
Shear modulus of elasticity (EN 12090)	-	$\geq 1.00 \text{ N/mm}^2$	pass
Conductivity (λ) (EN 12667)	$\leq 0.031 \text{ W/mK}$	-	-
Thermal resistance for the minimum thickness (30 mm) (EN 12667)	-	-	0.96 m ² K/W
Thickness (EN 823)	T2 (EN 13163)	-	-
Length (EN 822)	L1 (EN 13163)	-	-
Width (EN 822)	W2 (EN 13163)	-	-
Squareness (EN 824)	S2 (EN 13163)	-	-
Flatness (EN 825)	P4 (EN 13163)	-	-
Surface conditions	Cut surface	-	-
Density (EN 1602)	20 kg/m ³ ($\pm 10\%$)	-	-
Dimensional stability (23° \pm 2°C, 50 \pm 5% RH) (EN 1603)	DS(N) 2 (EN 13163)	$\leq 0.2 \%$	-
Dimensional stability (70° \pm 2° C for 7 days) (EN 1604)	DS(70,-) 1 (EN 13163)	$\leq 0.5 \%$	-

Tab. 15: Characteristics of Insulation product “EPS con grafite”

3.3.3 Insulation product “EPS 80”

Expanded Polystyrene panels with right edges. Their characteristics are given in the following table.

<i>Characteristic (test method)</i>	<i>Declared value (classification, standard, reference)</i>	<i>Minimum/maximum value (when envisaged from ETAG 004)</i>	<i>Pass/fail or statement of the value (when envisaged from ETAG 004)</i>
Reaction to fire (EN 11925-2) thickness: 30 -300 mm density: 15 kg/m ³	Euroclass E (EN 13501-1)	-	-
Water absorption by partial immersion (EN 1609) thickness: 40 mm density: 15 kg/m ³	-	$\leq 1 \text{ kg/m}^2$	pass
Water vapour permeability (μ) (EN 12086) thickness: 40 mm	-	-	46.92
Tensile strength (EN 1607)	150 KPa (EN 13163)	-	-
Shear strength (EN 12090)	-	$\geq 0.02 \text{ N/mm}^2$	pass
Shear modulus of elasticity (EN 12090)	-	$\geq 1.00 \text{ N/mm}^2$	pass
Conductivity (λ) (EN 12667)	$\leq 0.037 \text{ W/mK}$	-	-

Thermal resistance for the minimum thickness (30 mm) (EN 12667)	-	-	0.81 m ² K/W
Thickness (EN 823)	T2 (EN 13163)	-	-
Length (EN 822)	L2 (EN 13163)	-	-
Width (EN 822)	W2 (EN 13163)	-	-
Squareness (EN 824)	S2 (EN 13163)	-	-
Flatness (EN 825)	P4 (EN 13163)	-	-
Surface conditions	Cut surface	-	-
Density (EN 1602)	15 kg/m ³ (± 6 %)	-	-
Dimensional stability (23° ± 2°C, 50 ± 5% RH) (EN 1603)	DS(N) 2 (EN 13163)	≤ 0.2 %	-
Dimensional stability (70° ± 2° C for 7 days) (EN 1604)	DS(70,-) 1 (EN 13163)	≤ 0.5 %	-

Tab. 16: Characteristics of Insulation product “EPS 80”

3.3.4 Insulation product “EPS 100”

Expanded Polystyrene panels with right edges. Their characteristics are given in the following table.

<i>Characteristic (test method)</i>	<i>Declared value (classification, standard, reference)</i>	<i>Minimum/maximum value (when envisaged from ETAG 004)</i>	<i>Pass/fail or statement of the value (when envisaged from ETAG 004)</i>
Reaction to fire (EN 11925-2) thickness: 30 -300 mm density: 18 kg/m ³	Euroclass E (EN 13501-1)	-	-
Water absorption by partial immersion (EN 1609) thickness: 40 mm density: 18 kg/m ³	-	≤ 1 kg/m ²	pass
Water vapour permeability (μ) (EN 12086) thickness: 40 mm	-	-	30.857
Tensile strength (EN 1607)	150 KPa (EN 13163)	-	-
Shear strength (EN 12090)	-	≥ 0.02 N/mm ²	pass
Shear modulus of elasticity (EN 12090)	-	≥ 1.00 N/mm ²	pass
Conductivity (λ) (EN 12667)	≤ 0.036 W/mK	-	-
Thermal resistance for the minimum thickness (30 mm) (EN 12667)	-	-	0.85 m ² K/W
Thickness (EN 823)	T2 (EN 13163)	-	-
Length (EN 822)	L2 (EN 13163)	-	-
Width (EN 822)	W2 (EN 13163)	-	-
Squareness (EN 824)	S2 (EN 13163)	-	-
Flatness (EN 825)	P4 (EN 13163)	-	-
Surface conditions	Cut surface	-	-

Density (EN 1602)	18 kg/m ³ (± 6 %)	-	-
Dimensional stability (23° ± 2°C, 50 ± 5% RH) (EN 1603)	DS(N) 2 (EN 13163)	≤ 0.2 %	-
Dimensional stability (70° ± 2° C for 7 days) (EN 1604)	DS(70,-) 1 (EN 13163)	≤ 0.5 %	-

Tab. 17: Characteristics of Insulation product “EPS 100”

3.3.5 Insulation product “Colorex”

Expanded Polystyrene panels with right edges. Their characteristics are given in the following table.

<i>Characteristic (test method)</i>	<i>Declared value (classification, standard, reference)</i>	<i>Minimum/maximum value (when envisaged from ETAG 004)</i>	<i>Pass/fail or statement of the value (when envisaged from ETAG 004)</i>
Reaction to fire (EN 11925-2) thickness: 30 -300 mm density: 18 kg/m ³	Euroclass E (EN 13501-1)	-	-
Water absorption by partial immersion (EN 1609) thickness: 40 mm density: 18 kg/m ³	-	≤ 1 kg/m ²	pass
Water vapour permeability (μ) (EN 12086) thickness: 40 mm	-	-	29.185
Tensile strength (EN 1607)	150 KPa (EN 13163)	-	-
Shear strength (EN 12090)	-	≥ 0.02 N/mm ²	pass
Shear modulus of elasticity (EN 12090)	-	≥ 1.00 N/mm ²	pass
Conductivity (λ) (EN 12667)	≤ 0.032 W/mK	-	-
Thermal resistance for the minimum thickness (30 mm) (EN 12667)	-	-	0.93 m ² K/W
Thickness (EN 823)	T2 (EN 13163)	-	-
Length (EN 822)	L2 (EN 13163)	-	-
Width (EN 822)	W2 (EN 13163)	-	-
Squareness (EN 824)	S2 (EN 13163)	-	-
Flatness (EN 825)	P4 (EN 13163)	-	-
Surface conditions	Cut surface	-	-
Density (EN 1602)	18 kg/m ³ (± 6 %)	-	-
Dimensional stability (23° ± 2°C, 50 ± 5% RH) (EN 1603)	DS(N) 2 (EN 13163)	≤ 0.2 %	-
Dimensional stability (70° ± 2° C for 7 days) (EN 1604)	DS(70,-) 1 (EN 13163)	≤ 0.5 %	-

Tab. 18: Characteristics of Insulation product “Colorex”

3.3.6 Rendering system (base coat + reinforcement)

3.3.6.1 Rendering system strip tensile test

The test has been carried out in accordance with § 5.5.4.1 of ETAG 004.

A 50

Rendering system strain value	mean value of cracks in warp direction (mm)	mean value of cracks in weft direction (mm)
0.3 %	$0.15 < w \leq 0.20$	$0.15 < w \leq 0.20$
0.5 %	$0.20 < w \leq 0.25$	$0.20 < w \leq 0.25$
0.8 %	$0.20 < w \leq 0.25$	$0.20 < w \leq 0.25$
1.0 %	$w \geq 0.25$	$0.20 < w \leq 0.25$
1.5 %		$0.20 < w \leq 0.25$
n° of cracks	15 (mean value)	16 (mean value)

Tab. 19: Rendering system strip tensile test results (w = crack's width) with "A 50"

A 96

Rendering system strain value	mean value of cracks in warp direction (mm)	mean value of cracks in weft direction (mm)
0.3 %	$0.10 < w \leq 0.15$	$0.10 < w \leq 0.15$
0.5 %	$0.10 < w \leq 0.15$	$0.10 < w \leq 0.15$
0.8 %	$0.15 < w \leq 0.20$	$0.10 < w \leq 0.15$
1.0 %	$0.10 < w \leq 0.15$	$0.10 < w \leq 0.15$
1.5 %	$0.15 < w \leq 0.20$	$0.10 < w \leq 0.15$
2.0 %	$0.15 < w \leq 0.20$	$0.10 < w \leq 0.15$
n° of cracks	17 (mean value)	18 (mean value)

Tab. 20: Rendering system strip tensile test results (w = crack's width) with "A 96"

AL 88

Rendering system strain value	mean value of cracks in warp direction (mm)	mean value of cracks in weft direction (mm)
0.3 %	$0.05 < w \leq 0.10$	$0.05 < w \leq 0.10$
0.5 %	$0.05 < w \leq 0.10$	$0.05 < w \leq 0.10$
0.8 %	$0.10 < w \leq 0.15$	$0.05 < w \leq 0.10$
1.0 %	$0.10 < w \leq 0.15$	$0.10 < w \leq 0.15$
1.5 %	$0.10 < w \leq 0.15$	$0.10 < w \leq 0.15$
n° of cracks	16 (mean value)	16 (mean value)

Tab. 21: Rendering system strip tensile test results (w = crack's width) with "AL 88"

3.3.7 Reinforcement (glass fibre mesh)

The reinforcement is a glass fibre meshes and its characteristics have been verified through the Identification methods envisaged in Annex C of ETAG 004.

3.3.7.1 Residual strength of reinforcement after ageing:

Strength after ageing	Results	Acceptance criteria
Residual strength after ageing	$\geq 20 \text{ N/mm}$	$\geq 20 \text{ N/mm}$
Relative residual resistance (% after ageing) of strength in the as delivered state	$\geq 50 \%$ of the value at as delivered state	$\geq 50 \%$ of the value at as delivered state

Tab. 22: Residual strength after ageing

4. Assessment and Verification of Constancy of Performance (hereinafter AVCP) system applied, with reference to its legal base

According to Decision 97/556/EC¹¹ of the European Commission amended by the Decision 001/596/EC, the AVCP (see Annex V to Regulation (EU) 305/2011) given in the following table applies.

Product	Intended use	Level or class (reaction to fire)	System
External thermal insulation composite systems/kits (ETICS) with rendering	in external wall subject to fire regulations	A1 ⁽¹⁾ , A2 ⁽¹⁾ , B ⁽¹⁾ , C ⁽¹⁾	1
		A1 ⁽²⁾ , A2 ⁽²⁾ , B ⁽²⁾ , C ⁽²⁾ , D, E, (A1 to E) ⁽³⁾ , F	2+
	in external wall not subject to fire regulations	any	2+

Tab. 33: AVCP system

⁽¹⁾ Products/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).

⁽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).

Considering the Euroclass B for the reaction to fire and that no stage in production process has been identified that corresponds to an improvement of the reaction to fire classification, the system of Attestation of Conformity is System 2+ (see Annex V to Regulation (EU) 305/2011 for tasks and responsibilities).

5. Technical details necessary for the implementation of the AVCP system, as provided for in ETAG 004 used as EAD

Technical details necessary for the implementation of the AVCP system are laid down in the Control Plan which is deposited at ITC CNR.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between ITC CNR and the Notified Body.

**Issued in San Giuliano Milanese, Italy on 22/01/2018
by ITC – CNR**

**Prof. Antonio Occhiuzzi
Director of ITC-CNR**

¹¹ Official Journal of the European Communities L 254 of 8.10.1996