

European Technical Assessment

ETA-18/0600
of 05/11/2018

General Part

Technical Assessment Body issuing the European Technical Assessment: ICiMB

Trade name of the construction product	GREINPLAST MW
Product family to which the construction product belongs	External Thermal Insulation Composite Systems (ETICS) with rendering
Manufacturer	GREINPLAST Sp. z o.o. Krasne 512B 36-007 Krasne, POLAND
Manufacturing plant	GREINPLAST Sp. z o.o. Krasne 512B 36-007 Krasne, POLAND
This European Technical Assessment contains	26 pages including 3 Annexes which form an integral part of this assessment. Annex No 4 Control Plan 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	ETAG 004 used as EAD, 2013

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Specific parts

1. Technical description of the product

This product GREINPLAST MW is an ETICS (External Thermal Insulation Composite System with rendering) - a kit comprising components which are factory-produced by the manufacturer or component suppliers. The ETICS manufacturer is ultimately responsible for all components of the ETICS specified in this ETA.

The ETICS kit comprises a prefabricated insulation product of mineral wool (MW) to be bonded or mechanically fixed onto a wall. The method of fixing and the relevant components are specified in Table 1. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer.

The ETICS may include special fittings (e.g. base profiles, corner profiles) to treat details of ETICS (connections, apertures, corners, parapets, sills). Assessment and performance of these components is not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

Table 1.

	Components	Coverage (kg/m ²)	Thickness (mm)
Bonded ETICS; fully bonded with supplementary mechanical fixings. National application documents shall be taken into account.			
Insulation materials with associated methods of fixing	<ul style="list-style-type: none"> • Insulation product: mineral wool (MW) lamella according to EN 13162 <i>Product characteristics - see Annex No 1</i> 	-	40 to 300
	<ul style="list-style-type: none"> • Adhesives: <ul style="list-style-type: none"> - GREINPLAST KWP cement based powder requiring addition of 0,24-0,27 l/kg of water: <ul style="list-style-type: none"> - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C - GREINPLAST KW cement based powder requiring addition of 0,24-0,27 l/kg of water: <ul style="list-style-type: none"> - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C 	5,0 to 6,0 (powder)	-
	<ul style="list-style-type: none"> • Supplementary mechanical fixings: Plastic anchors covered by relevant ETA 	-	-

Table 1. cont.

Components	Coverage (kg/m ²)	Thickness (mm)	
Mechanically fixed ETICS; mechanically fixed with supplementary adhesive. National application documents shall be taken into account.			
Insulation materials with associated methods of fixing	<ul style="list-style-type: none"> • Insulation product: mineral wool (MW) standard boards according to EN 13162 <i>Product characteristics - see Annex No 1</i> 	-	20 to 300
	<ul style="list-style-type: none"> • Anchors <i>Products characteristics - see Annex No 2</i> 	-	-
	<ul style="list-style-type: none"> • Supplementary adhesives: <ul style="list-style-type: none"> - GREINPLAST KWP cement based powder requiring addition of 0,24-0,27 l/kg of water: <ul style="list-style-type: none"> - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C - GREINPLAST KW cement based powder requiring addition of 0,24-0,27 l/kg of water <ul style="list-style-type: none"> - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C 	5,0 to 6,0 (powder)	-

Table 1. cont.

	Components	Coverage (kg/m ²)	Thickness (mm)
Mechanically fixed ETICS; mechanically fixed with supplementary adhesive. National application documents shall be taken into account.			
Insulation materials with associated methods of fixing	<ul style="list-style-type: none"> Insulation product: mineral wool (MW) double density boards according to EN 13162 <i>Product characteristics - see Annex No 1</i> 	-	50 to 300
	<ul style="list-style-type: none"> Anchors <i>Products characteristics - see Annex No 2</i> 	-	-
	<ul style="list-style-type: none"> Supplementary adhesives: <ul style="list-style-type: none"> - GREINPLAST KWP cement based powder requiring addition of 0,24-0,27 l/kg of water: - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C - GREINPLAST KW cement based powder requiring addition of 0,24-0,27 l/kg of water: - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C 	5,0 to 6,0 (powder)	-
Base coat	<ul style="list-style-type: none"> - GREINPLAST KW cement based powder requiring addition of 0,24-0,27 l/kg of water - standard version to be used in the temperature range from 5 °C to 25 °C - autumn-spring version to be used in the temperature range from 0 °C to 15 °C 	4,0 to 6,0* (powder)	3,0 to 6,0
Reinforcement	<ul style="list-style-type: none"> Standard glass fibre meshes: applied in one or two layers - SSA-1363-145 - SSA-1363-160 - A150 - TG 15 - EUROWEK STANDARD - EUROWEK LUX <i>Products characteristics - see Annex No 3</i> 	- - - - - -	- - - - - -

*depending on number of layers of glass fibre meshes

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Key coats	<ul style="list-style-type: none"> • GREINPLAST PP Ready to use liquid to be used with following finishing coats: - GREINPLAST TB, GREINPLAST TK - GREINPLAST G/KGP - GREINPLAST GN - GREINPLAST TPB 	about 0,40	-
	<ul style="list-style-type: none"> • GREINPLAST XP Ready to use liquid to be used with following finishing coats: - GREINPLAST THB - GREINPLAST TSB, GREINPLAST TSK - Silikonowa masa strukturalna GREINPLAST MSX - GREINPLAST TXB + Silikonowa masa strukturalna GREINPLAST MSX - GREINPLAST TXB, GREINPLAST TXK - GREINPLAST TNB 	about 0,40	-
Finishing coats	<ul style="list-style-type: none"> • Mineral finishing coats: Cement based powders requiring addition of 0,20-0,23 l/kg of water GREINPLAST TB structure - particles size floated - 1,0; 1,5; 2,0; 2,5; 3,0 mm GREINPLAST TK structure - particles size ribbed - 1,5; 2,0; 2,5; 3,0 mm • Acrylic finishing coats: Ready to use pastes – acrylic binder GREINPLAST G/KGP structure - particles size mosaic - 0,8 ÷ 1,2; 1,0 ÷ 1,6; 1,2 ÷ 2,0 mm GREINPLAST GN structure - particles size mosaic - 0,1 ÷ 0,8; 0,1 ÷ 1,2 mm • Silicone (biohydrophobic) finishing coat: Ready to use paste – silicone binder, acrylic copolymer dispersion GREINPLAST TPB structure - particles size floated - 1,0; 1,5; 2,0; 2,5; 3,0 mm 	 1,4 to 4,8 2,0 to 4,0 2,0 to 7,0 1,4 to 6,0 1,4 to 4,8	Regulated by particles size

Table 1. cont.

	Components	Coverage (kg/m ²)	Thickness (mm)
Finishing coats	<ul style="list-style-type: none"> • Silicone-silicate finishing coat: Ready to use paste – silicone, silicate binder, acrylic copolymer dispersion 		
	GREINPLAST THB structure - particles size floated - 1,0; 1,5; 2,0; 2,5; 3,0 mm	1,4 to 4,8	Regulated by particles size
	<ul style="list-style-type: none"> • Silicate finishing coats: Ready to use pastes – silicate binder, acrylic copolymer dispersion 		
	GREINPLAST TSB structure - particles size floated - 1,0; 1,5; 2,0; 2,5; 3,0 mm	1,4 to 4,8	
	GREINPLAST TSK structure - particles size ribbed - 1,5; 2,0; 2,5; 3,0 mm	2,0 to 4,8	
	<ul style="list-style-type: none"> • Silicone finishing coats: Ready to use pastes – silicone binder, acrylic copolymer dispersion 		
	Silicone structural paste GREINPLAST MSX spread or modelled structure	1,8 to 6,0	1,0 to 3,0
	spread structure – to be used optionally with GREINPLAST TXB 1,0 mm or 1,5 mm	0,8 to 2,0	0,5 to 1,5
	GREINPLAST TXB structure - particles size floated - 1,0; 1,5; 2,0; 2,5; 3,0 mm	1,4 to 4,8	
	GREINPLAST TXK structure - particles size ribbed 1,5; 2,0; 2,5; 3,0 mm	2,0 to 4,8	Regulated by particles size
<ul style="list-style-type: none"> • Nano-silicone finishing coat: Ready to use paste – silicone binder, copolymer dispersion 			
GREINPLAST TNB structure - particles size: floated – 1,0; 1,5; 2,0; 2,5; 3,0 mm	1,4 to 4,5		
Decorative coats	<ul style="list-style-type: none"> • GREINPLAST FS Ready to use pigmented liquid – silicate binder, acrylic copolymer dispersion; to be used optionally with: - mineral finishing coats GREINPLAST TB, GREINPLAST TK - silicate finishing coats GREINPLAST TSB, GREINPLAST TSK 	0,20 to 0,40	-

Table 1. cont.

	Components	Coverage (kg/m ²)	Thickness (mm)
Decorative coats	<ul style="list-style-type: none"> • GREINPLAST FX Ready to use pigmented liquid – silicone binder, acrylic copolymer dispersion; to be used optionally with: <ul style="list-style-type: none"> - mineral finishing coats GREINPLAST TB, GREINPLAST TK - silicone (biohydrophobic) finishing coat GREINPLAST TPB - silicone-silicate finishing coat GREINPLAST THB - silicate finishing coats GREINPLAST TSB, GREINPLAST TSK - Silicone structural paste GREINPLAST MSX - silicone finishing coat GREINPLAST TXB + Silicone structural paste GREINPLAST MSX - silicone finishing coats GREINPLAST TXB, GREINPLAST TXK - nano-silicone finishing coat GREINPLAST TNB 	0,20 to 0,40	-
	<ul style="list-style-type: none"> • GREINPLAST FNX Ready to use pigmented liquid – silicone-acrylic dispersion (hybrid); to be used optionally with: <ul style="list-style-type: none"> - mineral finishing coats GREINPLAST TB, GREINPLAST TK - silicone (biohydrophobic) finishing coat GREINPLAST TPB - silicone-silicate finishing coat GREINPLAST THB - silicate finishing coats GREINPLAST TSB, GREINPLAST TSK - Silicone structural paste GREINPLAST MSX - silicone finishing coat GREINPLAST TXB + Silicone structural paste GREINPLAST MSX - silicone finishing coats GREINPLAST TXB, GREINPLAST TXK, - nano-silicone finishing coat GREINPLAST TNB 	0,20 to 0,40	-
Ancillary materials	Remain under the manufacturer's responsibility		

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

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones) or concrete (cast on site or as prefabricated panels).

The 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 made of non load-bearing construction elements. It 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 effect of weathering.

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

The provisions made in this European Technical Assessment are based on an assumed working life of the ETICS of at least 25 years, provided that the requirements for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected, economically reasonable working life of the works.

Design, installation, maintenance and repair of ETICS shall be done in accordance with principles introduced in chapter 7 of ETAG 004, used as EAD, and shall be in conformity with Member States' legislation requirements.

The instructions regarding packaging, transport, storage and installation of ETICS are specified in the manufacturer's technical documentation.

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

The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes No 1+3.

3.1. Safety in case of fire (BWR 2)

3.1.1. Reaction to fire (ETAG 004: clause 5.1.2.1, EN 13501-1)

Table 2.

Configuration	Max. heat of combustion [MJ/kg]	Flame retardant content	Euroclass acc. to EN 13501-1
Adhesive	0,56	No flame retardant	A2 – s1, d0
MW boards* <i>density ≤ 150 kg/m³</i>	-		
Base coat	0,56		
Glass fibre mesh	10,94		
Key coat	1,59		
Finishing coat	2,82		
Decorative coat	6,14		
*organic content in quantity ensuring Euroclass A1 according to EN 13501-1			

Note: European reference fire scenario has not been laid down for facades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in facades. An additional assessment of ETICS according to national provisions might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.2. Hygiene, health and environment (BWR 3)

3.2.1. Water absorption (ETAG 004: clause 5.1.3.1)

- Base coat GREINPLAST KW:
 - Water absorption after 1 hour < 1 kg/m²;
 - Water absorption after 24 hours < 0,5 kg/m².
- Rendering systems: Table 3.

Table 3.

		Water absorption after 24 hours	
		<0,5 kg/m ²	≥0,5 kg/m ²
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	x	-
	GREINPLAST G/KGP	x	-
	GREINPLAST GN	x	-
	GREINPLAST TPB	x	-
	GREINPLAST THB	x	-
	GREINPLAST TSB, GREINPLAST TSK	x	-
	Silicone structural paste GREINPLAST MSX	x	-
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	x	-
	GREINPLAST TXB, GREINPLAST TXK	x	-
	GREINPLAST TNB	x	-

3.2.2. Watertightness (ETAG 004: clause 5.1.3.2)

3.2.2.1. Hygrothermal behaviour (ETAG 004: clause 5.1.3.2.1)

Pass (without defects).

3.2.2.2. Freeze-thaw behaviour (ETAG 004: clause 5.1.3.2.2)

ETICS is frost resistant according to water absorption test.

3.2.3. Impact resistance (ETAG 004: clause 5.1.3.3)

Table 4.

		Single layer of standard mesh
MW board acc. to Annex No 1		
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	Category I
	GREINPLAST G/KGP	Category II
	GREINPLAST GN	Category I
	GREINPLAST TPB	Category II
	GREINPLAST THB	Category I
	GREINPLAST TSB, GREINPLAST TSK	Category I
	Silicone structural paste GREINPLAST MSX	Category II
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB, GREINPLAST TXK	Category I
GREINPLAST TNB	Category I	
MW double density board acc. to Annex No 1		
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	Category I
	GREINPLAST G/KGP	Category I
	GREINPLAST GN	Category I
	GREINPLAST TPB	Category II
	GREINPLAST THB	Category I
	GREINPLAST TSB, GREINPLAST TSK	Category I
	Silicone structural paste GREINPLAST MSX	Category II
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB, GREINPLAST TXK	Category I
GREINPLAST TNB	Category I	

Table 4. cont.

		Single layer of standard mesh
		MW lamella acc. to Annex No 1
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	Category II
	GREINPLAST G/KGP	Category II
	GREINPLAST GN	Category I
	GREINPLAST TPB	Category II
	GREINPLAST THB	Category I
	GREINPLAST TSB, GREINPLAST TSK	Category I
	Silicone structural paste GREINPLAST MSX	Category II
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	Category II
	GREINPLAST TXB, GREINPLAST TXK	Category I
	GREINPLAST TNB	Category I

Table 4. cont.

		Double layer of standard mesh
MW double density board acc. to Annex No 1		
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	Category I
	GREINPLAST G/KGP	Category I
	GREINPLAST GN	Category I
	GREINPLAST TPB	Category I
	GREINPLAST THB	Category I
	GREINPLAST TSB, GREINPLAST TSK	Category I
	Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB, GREINPLAST TXK	Category I
	GREINPLAST TNB	Category I
MW lamella acc. to Annex No 1		
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	Category I
	GREINPLAST G/KGP	Category I
	GREINPLAST GN	Category I
	GREINPLAST TPB	Category I
	GREINPLAST THB	Category I
	GREINPLAST TSB, GREINPLAST TSK	Category I
	Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	Category I
	GREINPLAST TXB, GREINPLAST TXK	Category I
	GREINPLAST TNB	Category I

3.2.4. Water vapour permeability (ETAG 004: clause 5.1.3.4)

Table 5.

			Equivalent air thickness s_d
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter + decorative coat:	GREINPLAST TB, GREINPLAST TK	GREINPLAST FS	≤ 1 m, result 0,2
		GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2
	GREINPLAST G/KGP*		≤ 1 m, result 0,3
	GREINPLAST GN*		≤ 1 m, result 0,2
	GREINPLAST TPB	GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2
	GREINPLAST THB	GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2
	GREINPLAST TSB, GREINPLAST TSK	GREINPLAST FS	≤ 1 m, result 0,2
		GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2
	Silicone structural paste GREINPLAST MSX	GREINPLAST FX	≤ 1 m, result 0,3
		GREINPLAST FNX	≤ 1 m, result 0,3
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	GREINPLAST FX	≤ 1 m, result 0,3
		GREINPLAST FNX	≤ 1 m, result 0,3
	GREINPLAST TXB, GREINPLAST TXK	GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2
	GREINPLAST TNB	GREINPLAST FX	≤ 1 m, result 0,2
		GREINPLAST FNX	≤ 1 m, result 0,2

*decorative coat not used

3.2.5. Release of dangerous substances (ETAG 004: clause 5.1.3.5, EOTA TR034)

No performance assessed.

Note: There may be requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need to be complied with, when and where they apply.

3.3. Safety and accessibility in use (BWR 4)

3.3.1. Bond strength between base coat and insulation product (ETAG 004: clause 5.1.4.1.1)

Base coat GREINPLAST KW

- Initial state:
≥ 0,08 MPa or failure into mineral wool
- After hygrothermal cycles:
≥ 0,08 MPa or failure into mineral wool

3.3.2. Bond strength between adhesive and substrate (ETAG 004: clause 5.1.4.1.2)

Table 6.

	Initial state	48 h immersion in water + 2 hours 23°C/50% RH	48 h immersion in water + 7 days 23°C/50% RH
GREINPLAST KWP	≥ 0,25 MPa	≥ 0,08 MPa	≥ 0,25 MPa
GREINPLAST KW	≥ 0,25 MPa	≥ 0,08 MPa	≥ 0,25 MPa

3.3.3. Bond strength between adhesive and insulation product (ETAG 004: clause 5.1.4.1.3)

Table 7.

	Initial state	48 h immersion in water + 2 hours 23°C/50% RH	48 h immersion in water + 7 days 23°C/50% RH
GREINPLAST KWP minimal bonded surface area: 40%	≥ 0,08 MPa	≥ 0,03 MPa	≥ 0,08 MPa
GREINPLAST KW minimal bonded surface area: 40%	≥ 0,08 MPa	≥ 0,03 MPa	≥ 0,08 MPa

3.3.4. Bond strength after ageing (ETAG 004: clause 5.1.7.1)

Table 8.

		After hygrothermal cycles
Rendering system: Base coat <u>GREINPLAST KW</u> + relevant key coat + finishing coat indicated hereafter:	GREINPLAST TB, GREINPLAST TK	≥ 0,08 MPa or failure into mineral wool
	GREINPLAST G/KGP	
	GREINPLAST GN	
	GREINPLAST TPB	
	GREINPLAST THB	
	GREINPLAST TSB, GREINPLAST TSK	
	Silicone structural paste GREINPLAST MSX	
	GREINPLAST TXB + Silicone structural paste GREINPLAST MSX	
	GREINPLAST TXB, GREINPLAST TXK	
	GREINPLAST TNB	

3.3.5. Fixing strength (ETAG 004, clause 5.1.4.2)

Test not required. ETICS fulfils the criteria $E \cdot d \leq 50\,000 \text{ N/mm}$.

3.3.6. Wind load resistance (ETAG 004, clause 5.1.4.3)

Table 9.

Anchors for which the following failure loads apply		Anchors according to Annex No 2 (surface assembly)	
		Plate diameter (mm)	≥ 60
Characteristics of the MW boards for which the following failure loads apply		Thickness (mm)	≥ 50
		Tensile strength perpendicular to the faces (kPa)	≥ 10
Failure loads (N)	Anchors not placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{panel}	Minimum: 206 Average: 257
	Anchors not placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{panel}	Minimum: 228 Average: 259
	Anchors placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{joint}	Minimum: 166 Average: 262
	Anchors placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{joint}	Minimum: 170 Average: 188

Table 10.

Anchors for which the following failure loads apply		Anchors according to Annex No 2 (surface assembly)	
		Plate diameter (mm)	≥ 60
Characteristics of the MW double density boards for which the following failure loads apply		Thickness (mm)	≥ 50
		Tensile strength perpendicular to the faces (kPa)	≥ 10
Failure loads (N)	Anchors not placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{panel}	Minimum: 359 Average: 402
	Anchors not placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{panel}	Minimum: 332 Average: 362
	Anchors placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{joint}	Minimum: 344 Average: 378
	Anchors placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{joint}	Minimum: 298 Average: 338

Table 11.

Anchor for which the following failure loads apply	Anchor eco-drive W according to Annex No 2 (partially countersunk assembly)		
	Plate diameter (mm)	≥ 110	
Characteristics of the MW boards for which the following failure loads apply	Thickness (mm)	≥ 100	
	Tensile strength perpendicular to the faces (kPa)	≥ 10	
Failure loads (N)	Anchors not placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{panel}	Minimum: 701 Average: 723
	Anchors not placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{panel}	No performance assessed
	Anchors placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{joint}	Minimum: 523 Average: 560
	Anchors placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{joint}	No performance assessed

Table 12.

Anchor for which the following failure loads apply	Anchor eco-drive W according to Annex No 2 (partially countersunk assembly)		
	Plate diameter (mm)	≥ 110	
Characteristics of the MW double density boards for which the following failure loads apply	Thickness (mm)	≥ 100	
	Tensile strength perpendicular to the faces (kPa)	≥ 10	
Failure loads (N)	Anchors not placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{panel}	Minimum: 1393 Average: 1446
	Anchors not placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{panel}	No performance assessed
	Anchors placed at the panel joints (<i>Pull-through test</i>) dry conditions	R_{joint}	Minimum: 892 Average: 1031
	Anchors placed at the panel joints (<i>Pull-through test</i>) wet conditions	R_{joint}	No performance assessed

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

$$R_d = \frac{R_{\text{panel}} \times n_{\text{panel}} + R_{\text{joint}} \times n_{\text{joint}}}{\gamma_m}$$

where:

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

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

γ_m : national safety factor

3.3.7. Render strip tensile test (ETAG 004: clause 5.5.4.1)

No performance assessed.

3.4. Protection against noise (BWR 5)

3.4.1. Airborne sound insulation (ETAG 004: clause 5.1.5.1)

No performance assessed.

3.5. Energy economy and heat retention (BWR 6)

3.5.1. Thermal resistance (ETAG 004: clause 5.1.6.1)

The thermal transmittance of the substrate wall covered by the ETICS is calculated in accordance with the standard EN ISO 6946:

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

where:

$\chi_p \cdot n$ has only to be taken into account if it is greater than $0,04 \text{ W}/(\text{m}^2 \cdot \text{K})$

U_c : global (corrected) thermal transmittance of the covered wall ($\text{W}/(\text{m}^2 \cdot \text{K})$)

n : number of anchors (through insulation product) per 1 m^2

χ_p : local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:

= $0,002 \text{ W}/\text{K}$ for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw

($\chi_p \cdot n$ negligible for $n < 20$)

= $0,004 \text{ W}/\text{K}$ for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p \cdot n$ negligible for $n < 10$)

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

U : thermal transmittance of the current part of the covered wall (excluding thermal bridges) ($\text{W}/(\text{m}^2 \cdot \text{K})$) determined as follows:

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

where:

- R_i: thermal resistance of the insulation product (according to declaration in reference to EN 13162) in (m²·K)/W
- R_{render}: thermal resistance of the render (about 0,02 in (m²·K)/W or determined by test according to EN 12667 or EN 12664)
- R_{substrate}: thermal resistance of the substrate of the building (concrete, brick) in (m²·K)/W
- R_{se}: external superficial thermal resistance in (m²·K)/W
- R_{si}: internal superficial thermal resistance in (m²·K)/W

The value of thermal resistance of each insulation product shall be given in the manufacturer's documentation along with the possible range of thicknesses. In addition, the point thermal conductivity of anchors shall be given when anchors are used in the ETICS.

3.6. Sustainable use of natural resources (BWR 7)

No performance assessed.

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

According to the European Commission decision 97/556/EC amended by the European Commission decision 2001/596/EC, the AVCP systems (further described in Annex V to Regulation (EU) No 305/2011) 1 and 2+ apply.

Table 13.

Product(s)	Intended use(s)	Level(s) or class(es) (Reaction to fire)	System(s)
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+

⁽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)

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

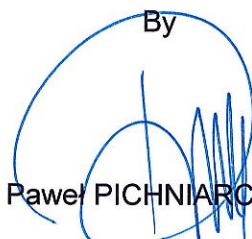
The manufacturer shall exercise permanent control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures. The production control system shall ensure performance constancy of the product covered by this European Technical Assessment.

The manufacturer may only use materials stated in the technical documentation of this European Technical Assessment. The factory production control shall be performed in accordance with the Control Plan which is a confidential part of the European Technical Assessment. The Control Plan was developed as a part of factory production control system.

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

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By



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Annexes:

Annex No 1 – Insulation products characteristics

Annex No 2 – Anchors characteristics

Annex No 3 – Glass fibre meshes characteristics

Annex No 1 – Insulation products characteristics

		Factory made mineral wool (MW) products according to EN 13162		
		MW board	MW double density board	MW lamella
Reaction to fire / EN 13501-1		Euroclass – A1 max. density: 150 kg/m ³	Euroclass – A1 max. density: 150 kg/m ³	Euroclass – A1 max. density: 150 kg/m ³
Thermal resistance		Defined in the CE marking in reference to EN 13162 (m ² ·K)/W	Defined in the CE marking in reference to EN 13162 (m ² ·K)/W	Defined in the CE marking in reference to EN 13162 (m ² ·K)/W
Thickness / EN 823		- 3 % or - 3 mm + 5 % or + 5 mm [EN 13162 - T4]	- 3 % or - 3 mm + 5 % or + 5 mm [EN 13162 - T4]	-
		- 1 % or - 1 mm + 3 mm [EN 13162 - T5]	- 1 % or - 1 mm + 3 mm [EN 13162 - T5]	- 1 % or - 1 mm + 3 mm [EN 13162 - T5]
Dimensional stability under specified conditions	EN 1604	1 % [EN 13162 - DS(70,-)]	1 % [EN 13162 - DS(70,-)]	1 % [EN 13162 - DS(70,-)]
	EN 1604	-	1 % [EN 13162 - DS(70,90)]	1 % [EN 13162 - DS(70,90)]
Short-term water absorption (partial immersion) / EN 1609		EN 13162 - WS	EN 13162 - WS	EN 13162 - WS
Long-term water absorption (partial immersion) / EN 12087		EN 13162 - WL(P)	EN 13162 - WL(P)	EN 13162 - WL(P)
Water vapour diffusion resistance factor (μ) / EN 12086		EN 13162 - 1	EN 13162 - 1	EN 13162 - 1
Tensile strength perpendicular to the faces in dry conditions / EN 1607		≥ 10 kPa [EN 13162 – TR10]	≥ 10 kPa [EN 13162 – TR10]	≥ 80 kPa [EN 13162 – TR80]
Shear strength / EN 12090		-	-	≥ 0,02 MPa
Shear modulus / EN 12090		-	-	≥ 1,0 MPa

Annex No 2 – Anchors characteristics

Anchor trade name	Plate stiffness (kN/mm) / diameter (mm)	Characteristic resistance in the substrate
Koelner KI-10	0,5 / 60	ETA-07/0291
Koelner KI-10M	0,4 / 60	
Koelner KI-10N	0,5 / 60	ETA-07/0221
Koelner KI-10NS	0,5 / 60	
Koelner TFIX-8M	1,0 / 60	ETA-07/0336
Koelner TFIX-8P	0,3 / 60	ETA-13/0845
Koelner TFIX-8S	0,6 / 60	ETA-11/0144
R-TFIX-8M	0,7 / 60	ETA-17/0592
R-TFIX-8S	0,6 / 60	ETA 17/0161
LFM-8	0,3 / 60	ETA-17/0450
LFM-10	0,3 / 60	
LMX-8	0,5 / 60	ETA-16/0509
LMX-10	0,5 / 60	
WK THERM \varnothing 8	0,6 / 60	ETA-11/0232
WK THERM S	0,6 / 60	ETA-13/0724
eco-drive W	0,6 / 110	ETA-13/0107
ejotherm STR U 2G	0,6 / 60	ETA-04/0023
EJOT H1 eco	0,6 / 60	ETA-11/0192
EJOT H4 eco	0,6 / 60	
ejotherm H2 eco	0,97 / 60	ETA-15/0740
ejotherm SDF-S plus + TE \varnothing 60/50	0,7 / 60	ETA-04/0064
ejotherm SDF-S plus + TE \varnothing 60/110	0,7 / 60	
Fischer Termoz 8U	0,5 / 60	ETA-02/0019
Fischer Termoz CN 8	0,4 / 60	ETA-09/0394
Fisher Termoz PN 8	0,4 / 60	ETA-09/0171
HTS-P	0,6 / 60	ETA-14/0400
HTS-M	0,6 / 60	
HTR-P	0,6 / 60	ETA-16/0116
HTR-M	0,6 / 60	
XI-FV	0,4 / 60	ETA-17/0304

Additionally, anchors covered by relevant ETA can be used, provided that they meet the following requirements:

	Requirement	
	Anchors fixed through insulation product (surface assembly)	Anchors fixed through insulation product (partially countersunk assembly)
Plate diameter	≥ 60 mm	≥ 110 mm
Plate stiffness	≥ 0,3 kN/mm	≥ 0,6 kN/mm
Failure loads	≥ R_{panel} and R_{joint} specified in Table 9 and 10	≥ R_{panel} and R_{joint} specified in Table 11 and 12

Annex No 3 – Glass fibre meshes characteristics

Mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
SSA-1363-145	Mass per unit area: 151 g/m ² Mesh size: 4,5 x 3,8 mm	≥ 20	≥ 50
SSA-1363-160	Mass per unit area: 165 g/m ² Mesh size: 4,0 x 3,9 mm	≥ 20	≥ 50
A150	Mass per unit area: 150 g/m ² Mesh size: 4,5 x 4,7 mm	≥ 20	≥ 50
TG-15	Mass per unit area: 160 g/m ² Mesh size: 3,5 x 3,5 mm	≥ 20	≥ 50
EUROWEK STANDARD	Mass per unit area: 141 g/m ² Mesh size: 4,5 x 4,8 mm	≥ 20	≥ 50
EUROWEK LUX	Mass per unit area: 163 g/m ² Mesh size: 4,2 x 4,9 mm	≥ 20	≥ 50