INSTYTUT TECHNIKI BUDOWLANEJ

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-21/1047 of 19/09/2025

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	ClimaWall® EPS
Product family to which the construction product belongs	External Thermal Insulation Composite System (ETICS) with rendering
Manufacturer	DRUCKFARBEN HELLAS S.A. Megaridos Ave., Kallistiri Area 19300 ASPROPYRGOS, Greece
Manufacturing plant	DRUCKFARBEN HELLAS S.A. Megaridos Ave., Kallistiri Area 19300 ASPROPYRGOS, Greece
This European Technical Assessment contains	21 pages including 3 Annexes which form an integral part of this Assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 040083-00-0404 “External thermal insulation composite systems (ETICS) with renderings”
This version replaces	ETA-21/1047 issued on 28/12/2021

This European Technical Assessment is issued by the Technical Assessment Body in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and shall be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may only be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

Specific Part

1 Technical description of the product

External Thermal Insulation Composite System with rendering ClimaWall® EPS called ETICS in the following text is a kit comprising components which are factory-produced by the manufacturer or purchased by the ETICS manufacturer from suppliers. ETICS is made up on site from these components. The ETICS manufacturer is ultimately responsible for all components of the ETICS kit specified in this ETA.

The ETICS comprises a factory-made thermal insulation product made of expanded polystyrene (EPS) to be bonded, bonded with supplementary mechanical fixings or mechanically fixed with supplementary adhesive, onto a wall. The methods of fixing and the ETICS composition are specified in Table 1.

The thermal insulation product is faced with a rendering system consisting of several layers (site applied), one of which contains reinforcement. The rendering system is applied directly to the insulating panels, without any air gap or disconnecting layer.

Table 1

	Components	Coverage (kg/m²)	Thickness (mm)
Thermal insulation products with methods of fixing	**Bonded ETICS:** fully bonded or bonded with supplementary mechanical fixings (bonded surface shall be 100%).		
	• **Insulation product:** Expanded polystyrene (EPS) panels and expanded polystyrene (EPS) graphite panels according to EN 13163; see Annex B – thermal insulation product characteristics	-	≤ 300
	• **Adhesive:** **Strong Bond Grey** cement based powder requiring addition of 0,24 to 0,26 l/kg of water	4,0 to 6,0 (powder)	-
	Mechanically fixed ETICS with supplementary adhesive: according to the manufacturer's recommendation the minimal bonded surface shall be at least 40%. National application documents shall be taken into account.		
	• **Insulation product:** Expanded polystyrene (EPS) panels and expanded polystyrene (EPS) graphite panels according to EN 13163; see Annex B - thermal insulation product characteristics	-	50 to 300
	• **Anchors:** see Annex C - anchor characteristics	-	-
	• **Supplementary adhesive:** see bonded ETICS	-	-
Base coats	• **Strong Bond White / Strong Bond Grey** cement based powder requiring addition of 0,24 to 0,26 l/kg of water	3,0 to 5,0 (powder)	2,0 to 3,0
	• **Flex Bond** ready to use paste	3,8 to 4,0	2,0 to 3,0
Glass fibre mesh	• **Standard glass fibre mesh:** **Clima Net 160** see Annex C – glass fibre mesh characteristics	1,1 (1)	-
Key coat	• **ClimaTop® Primer** (3) ready to use liquid to be used with all finishing coats	8,0 to 10,0 (2)	-

(1) glass fibre mesh coverage in m^2/m^2

(2) key coat coverage in m^2/l

(3) to be used with Strong Bond White / Grey base coat

Table 1

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• **Acrylic finishing coats:**		
	ClimaTop® Flexo FINE hydrophobically modified polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 0,6 mm	2,0 to 2,5	1,0 to 1,5
	ClimaTop® Flexo hydrophobically modified polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 0,8; 1,0; 1,5; 2,0 mm ribbed structure; max. particle size: 1,5 mm	1,4 to 3,7	regulated by particle size
	ClimaTop® FlexoSil FINE silicone modified polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 0,6 mm	2,0 to 2,5	1,0 to 1,5
	ClimaTop® FlexoSil silicone modified polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 0,8; 1,0; 1,5; 2,0 mm ribbed structure; max. particle size: 1,5 mm	1,4 to 3,7	regulated by particle size
	ClimaTop® Classic acrylic polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 0,8; 1,0; 1,2; 1,5; 2,0 mm ribbed structure; max. particle size: 1,5 mm	1,6 to 3,7	regulated by particle size
	ClimaTop® Basic acrylic polymer dispersion with natural filler, pigments and additives grained structure; max. particle size: 1,0; 1,5 mm	1,8 to 2,8	regulated by particle size
	ClimaTop® Elite acrylic polymer dispersion with natural filler, pigments and additives ultrafine finish; max. particle size: 0,1 mm to be used with ClimaTop® Classic 0,8; 1,0; 1,2 mm	1,5 to 2,0	0,3 to 0,8 (4)
	• **Silicate finishing coats:**		
	ClimaTop® Silica+ waterglass with hydrophobically modified polymer dispersion, colloidal silica, natural filler, pigments and additives grained structure; max. particle size: 1,0; 1,2; 1,5 mm to be used with Strong Bond White / Grey base coat	1,7 to 2,8	regulated by particle size
Ancillary materials	Remain under the ETICS manufacturer responsibility. The ETICS is supported with ancillary materials which are defined in clause 1.3.13 of EAD 040083-00-0404.		

(4) thickness of ClimaTop® Elite only

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

This ETICS is intended to be used as external thermal insulation applied on the walls of buildings. The walls are made of masonry (bricks, blocks, stones, etc.) or concrete (cast on site or as prefabricated panels) with or without rendering.

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

The ETICS gives the building wall to which it is applied additional thermal insulation and protection from effects of weathering.

The ETICS are non-load-bearing construction elements. They do not contribute directly to the stability of the wall on which they are installed.

The ETICS is not intended to ensure the air tightness 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 conditions 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 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 product.

The information concerning packaging, transport, storage, maintenance and repair shall be given in the manufacturer's technical documentation.

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

Performance of the ETICS related to the Basic Requirements is given in Table 2.

Table 2

No	Essential characteristic	Assessment method (EAD clause)	Performance
Safety in case of fire (BWR 2)			
1	Reaction to fire:	2.2.1	-
	– reaction to fire of ETICS	2.2.1.1	Annex A1
	– reaction to fire of the thermal insulation product	2.2.1.2	no performance assessed (see Annex B for thermal insulation product characteristics)
2	Façade fire performance	2.2.2	no performance assessed
Hygiene, health and the environment (BWR 3)			
3	Content, emission and/or release of dangerous substances – leachable substances	2.2.4	no performance assessed
4	Water absorption:	2.2.5	-
	– of the base coat and the rendering system	2.2.5.1	Annex A2
	– of the thermal insulation product	2.2.5.2	no performance assessed (see Annex B for thermal insulation product characteristics)
5	Water-tightness of the ETICS: Hygrothermal behaviour	2.2.6	Annex A3
6	Water-tightness of the ETICS: Freeze-thaw performance	2.2.7	Annex A3
7	Impact resistance	2.2.8	Annex A4
8	Water vapour permeability:	2.2.9	-
	– of the rendering system (equivalent air thickness s_d)	2.2.9.1	Annex A5
	– of thermal insulation product (water-vapour resistance factor)	2.2.9.2	no performance assessed (see Annex B for thermal insulation product characteristics)

Table 2

No	Essential characteristic	Assessment method (EAD clause)	Performance
Safety and accessibility in use (BWR 4)			
9	Bond strength:	2.2.11	-
	– bond strength between the base coat and the thermal insulation product (mortar or paste)	2.2.11.1	Annex A6
	– bond strength between the adhesive and the substrate	2.2.11.2	Annex A6
	– bond strength between the adhesive and the thermal insulation product	2.2.11.3	Annex A6
10	Fixing strength (transverse displacement test)	2.2.12	test not required because the ETICS fulfils the criteria $E \cdot d \leq 50.000$ N/mm
11	Wind load resistance of ETICS:	2.2.13	-
	– pull-through tests of fixings	2.2.13.1	Annex A7
	– static foam block test	2.2.13.2	Annex A7
	– dynamic wind uplift test	2.2.13.3	no performance assessed
12	Tensile test perpendicular to the faces of the thermal insulation product:	2.2.14	-
	– in dry conditions	2.2.14.1	no performance assessed (see Annex B for thermal insulation product characteristics)
13	Shear strength and shear modulus of elasticity test of ETICS	2.2.15	no performance assessed (see Annex B for thermal insulation product characteristics)
14	Render strip tensile test	2.2.17	no performance assessed
15	Bond strength after ageing:	2.2.20	-
	– bond strength after ageing of finishing coat tested on the rig	2.2.20.1	Annex A8
	– bond strength after ageing of finishing coat not tested on the rig	2.2.20.2	Annex A8
16	Mechanical and physical characteristics of the mesh:	2.2.21	-
	Tensile strength of the glass fibre mesh	2.2.21.1	Annex C
Protection against noise (BWR 5)			
17	Airborne sound insulation of ETICS	2.2.22.1	no performance assessed
18	Dynamic stiffness of the thermal insulation product	2.2.22.2	no performance assessed
19	Air flow resistance of the thermal insulation product	2.2.22.3	no performance assessed
Energy economy and heat retention (BWR 6)			
20	Thermal resistance and thermal transmittance of ETICS	2.2.23	Annex A9

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

According to Decision 97/556/EC of the European Commission amended by the Decision 2001/596/EC, the systems of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) given in table 3 apply.

Table 3

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+

(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 Class 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 European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

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 Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 19/09/2025 by Instytut Techniki Budowlanej

Anna Panek, MSc
Deputy Director of ITB

Table A1.1

Configuration	Maximum declared organic content	Declared flame retardant content	Reaction to fire class according to EN 13501-1
ETICS ClimaWall® EPS: • Adhesive: Strong Bond Grey	1,5%	-	**B – s1, d0**
• EPS: Class E according to EN 13501-1	-	-	
• Glass fibre mesh: Clima Net 160	-	-	
• Base coat: Flex Bond	11,8%	2%	
• Finishing coats: ClimaTop® FlexoSil, ClimaTop® FlexoSil FINE	11,8%	19,7%	
ETICS ClimaWall® EPS: • Adhesive: Strong Bond Grey	1,5%	-	**B – s1, d0**
• EPS: Class E according to EN 13501-1	-	-	
• Glass fibre mesh: Clima Net 160	-	-	
• Base coats: Strong Bond White, Strong Bond Grey	1,5%	-	
• Key coat: ClimaTop® Primer	25,5%	-	
• Finishing coats: ClimaTop® FlexoSil, ClimaTop® FlexoSil FINE	11,8%	19,7%	
ClimaTop® Classic, ClimaTop® Classic with ClimaTop® Elite, ClimaTop® Silica+	9,2%	-	
ETICS ClimaWall® EPS: • Adhesive: Strong Bond Grey	1,5%	-	**C – s1, d0**
• EPS: Class E according to EN 13501-1	-	-	
• Glass fibre mesh: Clima Net 160	-	-	
• Base coats: Strong Bond White, Strong Bond Grey	1,5%	-	
• Key coat: ClimaTop® Primer	25,5%	-	
• Finishing coats: ClimaTop® Flexo, ClimaTop® Flexo FINE	12%	-	

Table A1.2

Configuration	Maximum declared organic content	Declared flame retardant content	Reaction to fire class according to EN 13501-1
ETICS ClimaWall® EPS: • Adhesive: Strong Bond Grey	1,5%	-	**D – s3, d0**
• EPS: Class E according to EN 13501-1	-	-	
• Glass fibre mesh: Clima Net 160	-	-	
• Base coat: Flex Bond	11,8%	2%	
• Finishing coats: ClimaTop® Flexo, ClimaTop® Flexo FINE	12%	-	
ETICS ClimaWall® EPS: • Adhesive: Strong Bond Grey	1,5%	-	**B – s1, d0**
• EPS: Class E according to EN 13501-1 thickness ≤ 100 mm	-	-	
• Glass fibre mesh: Clima Net 160	-	-	
• Base coats: Strong Bond White, Strong Bond Grey	1,5%	-	
• Finishing coats: ClimaTop® Basic	6,5%	-	
Any other configuration – no performance assessed			

Table A2.1

Water absorption of the reinforced base coat	After 1 hour (kg/m^2)	After 24 hours (kg/m^2)
Strong Bond White	**0,08**	**0,34**
Strong Bond Grey	**0,04**	**0,21**
Flex Bond	**0,03**	**0,23**

Table A2.2

Water absorption of the complete rendering		After 1 hour (kg/m^2)	After 24 hours (kg/m^2)
Rendering system: Base coat: **Strong Bond White** + key coat + finishing coats indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE, particle size 2,0 mm	**0,01**	**0,07**
	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE, particle size 2,0 mm	**0,02**	**0,07**
	ClimaTop® Classic, particle size 2,0 mm	**0,10**	**0,59**
	ClimaTop® Classic + ClimaTop® Elite, particle size 1,2 mm + 0,1 mm	**0,01**	**0,13**
	ClimaTop® Silica+, particle size 1,5 mm	**0,03**	**0,38**
Rendering system: Base coat: **Strong Bond Grey** + key coat + finishing coats indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE, particle size 2,0 mm	**0,01**	**0,09**
	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE, particle size 2,0 mm	**0,02**	**0,12**
	ClimaTop® Classic, particle size 2,0 mm	**0,03**	**0,13**
	ClimaTop® Basic, particle size 1,5 mm	**0,06**	**0,45**
Rendering system: Base coat: **Flex Bond** + finishing coats indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE, particle size 2,0 mm	**0,01**	**0,10**
	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE, particle size 2,0 mm	**0,13**	**0,49**
	ClimaTop® Classic + ClimaTop® Elite, particle size 1,2 mm + 0,1 mm	**0,01**	**0,19**

Table A3.1

Water-tightness of the ETICS: Hygrothermal behavior
The ETICS is assessed resistant to hygrothermal cycles on a rig. ETICS passed the test without defects. **Resistant to hygrothermal cycles.**

Table A3.2

Water-tightness of the ETICS: Freeze-thaw performance
The ETICS with the base coat **Strong Bond White / Strong Bond Grey** and **finishing coat ClimaTop Classic** is tested for freeze-thaw behavior because of the water absorption of base coat and the rendering system is higher than 0,5 kg/m² after 24 hours. **Resistant to freeze-thaw performance.**
The ETICS with the base coat **Strong Bond White / Strong Bond Grey,** the key-coat and **remaining finishing coats** according to Table 1 is assessed freeze-thaw resistant because of the water absorption of base coat and the rendering system is less than 0,5 kg/m² after 24 hours. **Resistant to freeze-thaw performance.**
The ETICS with the base coat **Flex Bond** and **finishing coats ClimaTop® Flexo / ClimaTop® Flexo FINE, ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE, ClimaTop® Classic + ClimaTop® Elite** according to Table 1 is assessed freeze-thaw resistant because of the water absorption of base coat and the rendering system is less than 0,5 kg/m² after 24 hours. **Resistant to freeze-thaw performance.**

Table A3.3

Bond strength after freeze-thaw cycles					
Insulation product	**ETICS configuration**		**Rupture type**	**Bond strength (kPa)**	
				Individual	**Mean**
EPS	**Rendering system:** base coat **Strong Bond White** (with key-coat) + finishing coat indicated hereafter:	ClimaTop® Classic	failure in the insulation product	124	**128**
				125	
				132	
				124	
				134	

ClimaWall® EPS	**Annex A3** of European Technical Assessment ETA-21/1047
Water-tightness Water-tightness of the ETICS: Hygrothermal behavior Water-tightness of the ETICS: Freeze-thaw performance	

Table A4

Impact resistance				
ETICS after hygrothermal cycles on the rig				
ETICS with EPS according to Annex B and standard mesh (single layer)		**Cracks**	**Max. crack diameter (mm)**	**Impact resistance category**
Rendering system: base coat **Strong Bond White / Strong Bond Grey** (with the key-coat) + finishing coat indicated hereafter:	ClimaTop® Flexo FINE / ClimaTop® Flexo	No – 3 J Yes – 10 J	- 42,09	**II**
	ClimaTop® FlexoSil FINE / ClimaTop® FlexoSil	Yes – 3 J Yes – 10 J	21,42 39,47	**III**
	ClimaTop® Classic	Yes – 3 J Yes – 10 J	29,16 41,50	**III**
	ClimaTop® Basic	Yes – 3 J Yes – 10 J	20,57 36,02	**III**
Rendering system: base coat **Flex Bond** + finishing coat indicated hereafter:	ClimaTop® Flexo FINE / ClimaTop® Flexo	No – 3 J No – 10 J	- -	**I**
	ClimaTop® FlexoSil FINE / ClimaTop® FlexoSil	No – 3 J No – 10 J	- -	**I**
ETICS after ageing on the small samples				
ETICS with EPS according to Annex B and standard mesh (single layer)		**Cracks**	**Max. crack diameter (mm)**	**Impact resistance category**
Rendering system: base coat **Strong Bond White** (with the key-coat) + finishing coat indicated hereafter:	ClimaTop® Flexo FINE / ClimaTop® Flexo	No – 3 J No – 10 J	- -	**I**
	ClimaTop® FlexoSil FINE / ClimaTop® FlexoSil	No – 3 J No – 10 J	- -	**I**
	ClimaTop® Classic	Yes – 3 J Yes – 10 J	37,39 55,94	**III**
	ClimaTop® Classic + ClimaTop® Elite	Yes – 3 J Yes – 10 J	34,00 42,00	**III**
	ClimaTop® Silica+	No – 3 J No – 10 J	- -	**I**
Rendering system: base coat **Strong Bond Grey** (with the key-coat) + finishing coat indicated hereafter:	ClimaTop® Flexo FINE / ClimaTop® Flexo	No – 3 J No – 10 J	- -	**I**
	ClimaTop® FlexoSil FINE / ClimaTop® FlexoSil	No – 3 J No – 10 J	- -	**I**
	ClimaTop® Classic	Yes – 3 J Yes – 10 J	41,59 72,50	**III**
Rendering system: base coat **Flex Bond** + finishing coat indicated hereafter:	ClimaTop® Flexo FINE / ClimaTop® Flexo	No – 3 J No – 10 J	- -	**I**
	ClimaTop® FlexoSil FINE / ClimaTop® FlexoSil	No – 3 J No – 10 J	- -	**I**
	ClimaTop® Classic + ClimaTop® Elite	No – 3 J No – 10 J	- -	**I**

Table A5

	Finishing coat	Equivalent air thickness s_d m
Rendering system: base coat **Strong Bond White** / **Strong Bond Grey** (thickness 2 - 3 mm) (with the key-coat) + finishing coats indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE	0,6
	thickness 5,18 mm	
	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE	0,5
	thickness 4,74 mm	
	ClimaTop® Classic	1,7
	thickness 5,67 mm	
	ClimaTop® Basic	0,4
	thickness 3,66 mm	
	ClimaTop® Classic + ClimaTop® Elite	1,1
	thickness 3,60 mm	
	ClimaTop® Silica+	0,7
	thickness 3,48 mm	
Rendering system: base coat **Flex Bond** (thickness 2 - 3 mm) + finishing coats indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE	1,3
	thickness 4,57 mm	
	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE	1,0
	thickness 4,26 mm	
	ClimaTop® Classic + ClimaTop® Elite	1,1
	thickness 3,28 mm	
Any other configuration – no performance assessed		

Table A6.1

Bond strength between the base coat and the insulation product					
Insulation product	**Base coat**	**Conditioning before the test**	**Rupture type**	**Bond strength (kPa)**	
				Min.	**Mean**
EPS	**Strong Bond White (approx. 2 mm)**	Initial state (dry conditions)	failure in the insulation product	**94**	**102**
		After hygrothermal cycles (on the rig)		**177**	**187**
		After freeze-thaw cycles	failure in borderline between adhesive and the insulation product	**81**	**83**
	Strong Bond Grey (approx. 2 mm)	Initial state (dry conditions)	failure in the insulation product	**123**	**153**
		After hygrothermal cycles (on the rig)		**287**	**310**
	Flex Bond (approx. 2 mm)	Initial state (dry conditions)	failure in borderline between adhesive and the insulation product	**117**	**128**
		After hygrothermal cycles (on the rig)		**83**	**90**

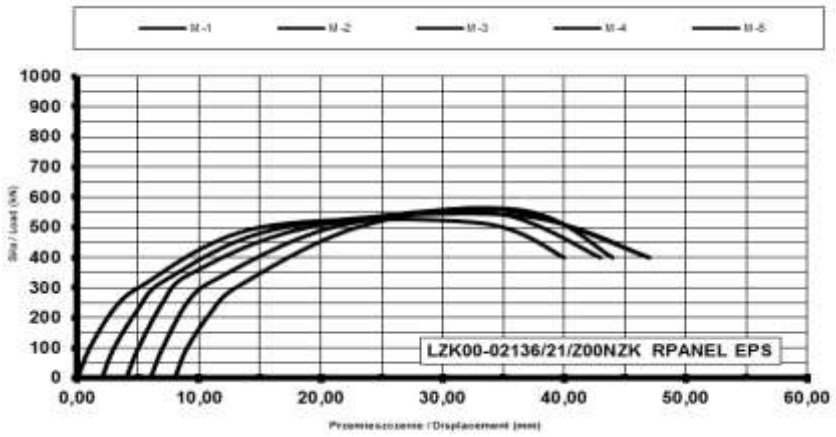
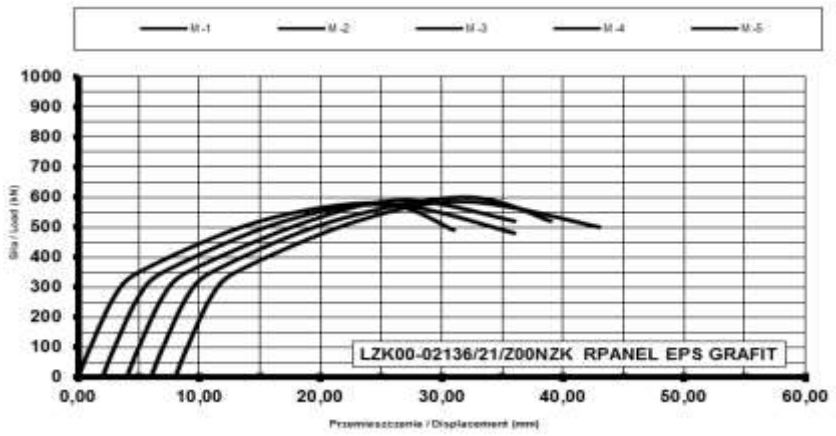
Table A6.2

Bond strength between the adhesive and the substrate					
Substrate	**Adhesive (and tested thickness)**	**Conditioning before the test**	**Rupture type**	**Bond strength (kPa)**	
				Min.	**Mean**
Concrete	**Strong Bond Grey (approx. 3 mm)**	Initial state (dry conditions)	failure in the adhesive	**870**	**1011**
		2 days immersion and 2 hours drying	failure in the adhesive	**847**	**1010**
		2 days immersion and min. 7 days drying	failure in the adhesive	**1843**	**2001**

Table A6.3

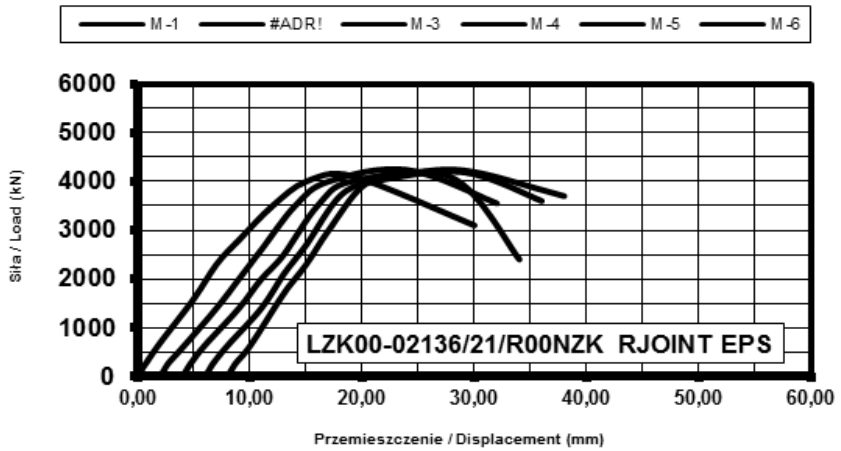
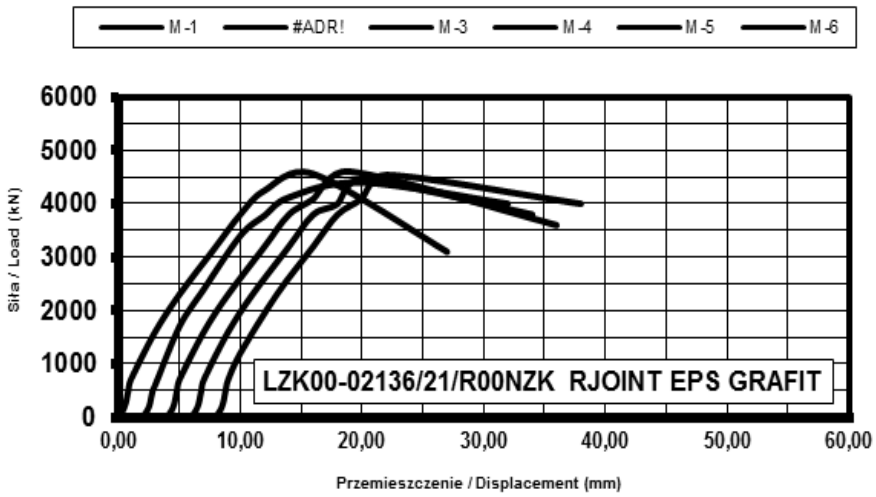
Bond strength between the adhesive and the insulation product					
Insulation product	**Base coat**	**Conditioning before the test**	**Rupture type**	**Bond strength (kPa)**	
				Min.	**Mean**
EPS	**Strong Bond White (approx. 3 mm)**	Initial state (dry conditions)	failure in borderline between adhesive and the insulation product and in the insulation product	**200**	**228**
		2 days immersion and 2 hours drying		**178**	**197**
		2 days immersion and min. 7 days drying		**183**	**205**
	Strong Bond Grey (approx. 3 mm)	Initial state (dry conditions)	failure in borderline between adhesive and the insulation product and in the insulation product	**224**	**232**
		2 days immersion and 2 hours drying		**162**	**198**
		2 days immersion and min. 7 days drying		**147**	**206**
	Flex Bond (approx. 3 mm)	Initial state (dry conditions)	failure in borderline between adhesive and the insulation product and in the insulation product	**292**	**302**
		2 days immersion and 2 hours drying		**167**	**189**
		2 days immersion and min. 7 days drying		**137**	**209**

Table A7.1

Anchor	**Anchors according to Annex C Surface assembly**			
	Plate diameter of the anchor, mm		≥ 60	
EPS Panels	Thickness, mm		≥ 50	
	Tensile strength perpendicular to the faces, kPa		≥ 150	
Failure load, kN	Anchors not placed at the panel joints (pull-through test), dry conditions	R_{panel}	Individual: Mean:	0,52; 0,54; 0,56; 0,557; 0,56 **0,55**
Load / displacement graphs				
Test conditions: dry condition 23 °C / 50 % RH				
EPS Graphite Panels	Thickness, mm		≥ 50	
	Tensile strength perpendicular to the faces, kPa		≥ 150	
Failure load, kN	Anchors not placed at the panel joints (pull-through test), dry conditions	R_{panel}	Individual: Mean:	0,58; 0,57; 0,59; 0,60; 0,59 **0,59**
Load / displacement graphs				
Test conditions: dry condition 23 °C / 50 % RH				

ClimaWall® EPS	**Annex A7.1** of European Technical Assessment ETA-21/1047
Wind load resistance of ETICS Pull-through test of fixings	

Table A7.2

Anchor	**Anchors according to Annex C Surface assembly**			
	Plate diameter of the anchor, mm		≥ 60	
EPS Panels	Thickness, mm		≥ 50	
	Tensile strength perpendicular to the faces, kPa		≥ 150	
Failure load, kN	Anchors placed at the panel joints (static foam block test)	R_{joint}	Individual: Mean:	0,51; 0,53; 0,50; 0,52; 0,52 **0,51**
Load / displacement graphs				
Test conditions: dry condition 23 °C / 50 % RH				
EPS Graphite Panels	Thickness, mm		≥ 50	
	Tensile strength perpendicular to the faces, kPa		≥ 150	
Failure load, kN	Anchors placed at the panel joints (static foam block test)	R_{joint}	Individual: Mean:	0,57; 0,54; 0,57; 0,55; 0,56 **0,56**
Load / displacement graphs				
Test conditions: dry condition 23 °C / 50 % RH				

ClimaWall® EPS	**Annex A7.2** of European Technical Assessment ETA-21/1047
Wind load resistance of ETICS Static foam block test of fixings	

Table A8

Bond strength after ageing of finishing coat tested on the rig					
Insulation product	**ETICS configuration**		**Rupture type**	**Bond strength (kPa)**	
				Individual	**Mean**
EPS	**Rendering system:** base coat **Strong Bond White** (with key-coat) + finishing coat indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE	failure in borderline between the insulation product and the base coat	165	**190**
				201	
				189	
				203	
				193	
		ClimaTop® Classic	failure in borderline between the insulation product and the base coat	160	**200**
				256	
				200	
				177	
				207	
		ClimaTop® Classic + ClimaTop® Elite	failure in the insulation product	167	**155**
				155	
				144	
				150	
				160	
		ClimaTop® Silica+	failure in the insulation product	171	**158**
				159	
				152	
				148	
				161	
	Rendering system: base coat **Strong Bond Grey** (with key-coat) + finishing coat indicated hereafter:	ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE	failure in borderline between the insulation product and the base coat	270	**293**
				320	
				241	
				317	
				317	
		ClimaTop® Basic	failure in borderline between the insulation product and the base coat or 50% in the insulation product and 50% in the adhesive	262	**253**
				164	
				220	
				335	
				283	
	Rendering system: base coat **Flex Bond** + finishing coat indicated hereafter:	ClimaTop® Flexo / ClimaTop® Flexo FINE	failure in borderline between the insulation product and the base coat	115	**96**
				97	
				85	
				85	
				97	
		ClimaTop® FlexoSil / ClimaTop® FlexoSil FINE	failure in borderline between the insulation product and the base coat	135	**142**
				117	
				149	
				152	
				156	
		ClimaTop® Classic + ClimaTop® Elite	failure in the insulation product	114	**138**
				143	
				135	
				147	
				153	

Table A9

Thermal resistance	
Thermal resistance	**[(m²·K)/W]**
R_{render}	**0,02**
R_{ETICS}	**≥ 1,00**

Information on calculation of thermal resistance and thermal transmittance of ETICS:

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

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

as described in EN ISO 10456.

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

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

with: U_c corrected thermal transmittance of the entire wall, including thermal bridges

U thermal transmittance of the entire wall, including ETICS, without thermal bridges

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

$R_{substrate}$ thermal resistance of the substrate wall [(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

$= \chi_p \cdot n$ (for anchors) (formula for U_c)

χ_p point thermal transmittance value of the anchor [W/K]. If not specified in ETA for anchors, the following values apply:

= 0.002 W/K for anchors with a plastic screw/nail, stainless steel screw/nail with the head covered by at least 15 mm plastic material, or with a minimum 15 mm air gap at the head of the screw/nail

= 0.004 W/K for anchors with a galvanized carbon steel screw/nail with the head covered by at least 15 mm plastic material or a minimum 15 mm air gap at the head of the screw/nail

= 0.008 W/K for all other anchors (worst case)

n number of anchors per m^2. In case n is more than 16, the formula for U_c is not applied

The influence of thermal bridges can also be calculated as described in EN ISO 10211.

It shall be calculated according to this standard if there are more than 16 anchors per m^2 foreseen. The declared χ_p values do not apply in this case.

Table B1

Factory-prefabricated expanded polystyrene (EPS) according to EN 13163			
Description and characteristics		**EPS**	**EPS Graphite**
Reaction to fire EN 13501-1		Class E	
Thermal resistance (m²·K)/W		Defined in the CE marking	
Thickness tolerance EN 823		EPS-EN 13163 – T1	
Length tolerance EN 822		EPS-EN 13163 – L2	
Width tolerance EN 822		EPS-EN 13163 – W2	
Squarness tolerance EN 824		EPS-EN 13163 – S2	
Flatness tolerance EN 825		EPS-EN 13163 – P5	
Dimensional stability	**laboratory conditions** EN 1603	EPS-EN 13163 – DS(N)2	
	under specified temperature and humidity EN 1604	-	EPS-EN 13163 – DS(70,90)1
Compressive stress at 10% thickness deformation EN 826		EPS-EN 13163 – CS(10)80 or EPS-EN 13163 – CS(10)100 or EPS-EN 13163 – CS(10)150 or EPS-EN 13163 – CS(10)200	
Tensile strength perpendicular to the faces in dry conditions EN 1607		EPS-EN 13163 – TR150	
Bending strength (kPa) EN 12089		≥ 125	
Shear strength (kPa) EN 12090		≥ 20	
Shear modulus (kPa) EN 12090		≥ 1000	

Table C1

Anchor trade name [1]		Plate diameter (mm)	Description of the anchor and characteristic resistance in the substrate
Clima Anchor	WKRĘT-MET KLIMAS LMX ϕ8	≥ 60	ETA-16/0509

[1] **In addition anchors meeting the following criteria can be used**:
- covered by ETA according to EAD 330196-00-0604 or EAD 330196-01-0604
- plate diameter ≥ 60 mm
- plate stiffness of anchor ≥ 0,5 kN/mm
- load resistance of anchor plate ≥ 1,09 kN
- anchors mounted on the insulation panel surface

Table C2

Mesh trade name		Description	Direction	Tensile strength N/mm (average value)		Elongation ε % (average value)	
				In the as-delivered state	After alkalis conditioning	In the as-delivered state	After alkalis conditioning
Clima Net 160	Lifitex PRO 165	ETA-19/0428	warp	41,3	20,8	4,2	1,8
			weft	46,7	24,1	5,0	1,7
	Fiberglass mesh BICO – 160 g/m^2	ETA-18/0372	warp	33,0	22,0	4,04	2,93
			weft	57,0	33,0	4,66	2,69
	E 132L	ETA-16/0068	warp	43,0	26,0	3,56	2,15
			weft	48,0	29,0	3,60	2,17