



**Technical and Test Institute
for Construction Prague**

Prosecká 811/76a
190 00 Praha
Czech Republic
eota@tzus.cz



Member of
www.eota.eu

European Technical Assessment

**ETA-21/0442
of 10/05/2021**

General Part

Technical Assessment Body issuing the European Technical Assessment:

Technical and Test Institute for Construction Prague

Trade name of the construction product

VIVECHROM THERMOPROTECT

Product family to which the construction product belongs

Product area code: 4
External Thermal Insulation Composite Systems (ETICS) with renderings
VIVECHROM DR. STEFANOS D.
PATERAS S.A.

Manufacturer

THESI VATHI PIGADI, 19600 MANDRA,
GREECE

Manufacturing plant(s)

VIVECHROM DR. STEFANOS D.
PATERAS S.A.

THESI VATHI PIGADI, 19600 MANDRA,
GREECE

This European Technical Assessment contains

19 pages including 4 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

Annex No. 5 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated.

This version is a corrigendum to

European Assessment Document (EAD)
040083-00-0404

External Thermal Insulation Composite Systems (ETICS) with renderings

ETA 21/0442, version 1,
issued on 10/05/2021

Specific Parts

1 Technical description of the product

1.1 Composition of the product (kit)

Table 1

Use and variant	Component	Coverage [kg/m ²]	Thickness [mm]
Adhesive 1	VIVEFLEX 200W Powder requiring addition of water 0.25 – 0.27 l/kg	4 – 6 (dry powder)	2 – 5
Thermal insulation product 1	Expanded polystyrene Factory made expanded polystyrene (EPS) See Annex No. 2	N/A	50 – 300
Anchors	Plastic anchors See Annex No. 3	N/A	N/A
Base coat 1	VIVEFLEX 200W Powder requiring addition of water 0.25 – 0.27 l/kg	3 – 7 (dry powder)	2 – 4
Reinforcement 1	THERMOPROTECT ΥΑΛΟΠΛΕΓΜΑ Standard glass fibre mesh One layer embedded in base coat in one layer. See Annex No. 4	0.160	< 1.0
Key coat 1	TOP BOND PRIMER Use with finishing coat 1 – 4	0.20 – 0.50 (liquid)	< 0.2
Key coat 2	STRONG GRIP PRIMER Use with finishing coat 1 – 4	0.30 – 0.40 (liquid)	< 0.2
Finishing coat 1	TOP ACRYLIC 1.0 Ready-to-use paste	1.7 – 2.0 (paste)	~ 1.0
Finishing coat 2	TOP ACRYLIC 1.5 Ready-to-use paste	2.5 – 2.8 (paste)	~ 1.5
Finishing coat 3	TOP ACRYLIC 2.0 Ready-to-use paste	3.3 – 3.6 (paste)	~ 2.0
Finishing coat 4	TOP SILICONE 1.0 Ready-to-use paste	1.7 – 2.0 (paste)	~ 1.0

Types of the ETICS can be distinguished, depending on the fixing method of thermal insulation:

Table 2

Component	Type of ETICS		
	Purely bonded ETICS	Bonded ETICS with supplementary anchors	Mechanically fixed ETICS with anchors with supplementary adhesive
Adhesive	VIVEFLEX 200W Min. 40 % area covered by adhesive	VIVEFLEX 200W Min. 40 % area covered by adhesive	VIVEFLEX 200W
Thermal insulation product	Expanded polystyrene See Annex No. 2	Expanded polystyrene See Annex No. 2	Expanded polystyrene See Annex No. 2
Anchors	Not to be used	Plastic anchors Annex No. 3	Plastic anchors Annex No. 3

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

This product is an External Thermal Insulation Composite System (ETICS) with renderings (rendering system). The product is a kit, comprising from number of components.

The ETICS may include special fittings (e.g. base profiles, corner profiles ...) to treat details of ETICS (connections, apertures, corners, parapets, sills ...). Special fittings are not listed nor assessed in this ETA.

The ETICS is installed in accordance with Manufacturer's installation instructions.

The ETICS may be used on new or existing (retrofit) vertical building walls. The walls can be made of masonry (bricks, blocks, stones, etc.) or concrete (cast on site or as prefabricated panels). The surface can be rendered and coated or uncoated.

The ETICS is designed for use on vertical walls but can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is a non-load-bearing construction element and it does not contribute directly to the stability of the wall on which it is installed.

The ETICS provides additional thermal insulation and protection from effect of weathering.

The provisions made in this ETA are based on an assumed intended working life of at least 25 years, provided that the ETICS installed and maintained properly. The indications given as to the working life of the construction product cannot be interpreted as a guarantee, but are regarded as means for expressing the expected economically reasonable working life of the product.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advice his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

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

The ETICS incorporates a number of possible combinations of components.

Table 4 – Table lay down assessments of essential characteristics along with information on for what combinations of components are the assessments valid.

If a specific configuration of components does not meet the requirements, “No performance assessed” applies in regard to the relevant essential characteristic.

Table 3

Essential characteristic	Assessment method (EAD clause)	Performance
Reaction to fire of ETICS	Cl. 2.2.1.1	See cl. 3.1.1
Reaction to fire of thermal insulation material	Cl. 2.2.1.2	No performance assessed
Façade fire performance	Cl. 2.2.2	No performance assessed
Content, emission and/or release of dangerous substances – leachable substances	Cl. 2.2.4	No performance assessed
Water absorption of the base coat and the rendering system	Cl. 2.2.5.1	See cl. 3.2.1
Water absorption of the insulation product	Cl. 2.2.5.2	No performance assessed
Water-tightness of the ETICS: hygrothermal behaviour	Cl. 2.2.6	See cl. 3.2.2
Water-tightness: freeze thaw performance	Cl. 2.2.7	See cl. 3.2.3
Impact resistance	Cl. 2.2.8	No performance assessed
Water vapour permeability of the rendering system (equivalent air thickness s_d)	Cl. 2.2.9.1	No performance assessed
Water vapour permeability of thermal insulation product (water-vapour resistance factor)	Cl. 2.2.9.2	No performance assessed
Bond strength between the base coat and the thermal insulation product (mortar or paste)	Cl. 2.2.11.1	See cl. 3.3.1
Bond strength between the adhesive and the substrate	Cl. 2.2.11.2	See cl. 3.3.2
Bond strength between the adhesive and the thermal insulation product	Cl. 2.2.11.3	See cl. 3.3.3
Fixing strength (transverse displacement)	Cl. 2.2.12	No performance assessed
Wind load resistance of ETICS – pull-through tests of fixings	Cl. 2.2.13.1	See cl. 3.3.4
Wind load resistance of ETICS – static foam block test	Cl. 2.2.13.2	No performance assessed
Wind load resistance of ETICS – dynamic wind uplift test	Cl. 2.2.13.3	No performance assessed
Tensile test perpendicular to the faces of the thermal insulation product – in dry conditions	Cl. 2.2.14.1	No performance assessed
Tensile test perpendicular to the faces of the thermal insulation product – in wet conditions	Cl. 2.2.14.2	No performance assessed
Shear strength and shear modulus of elasticity test of ETICS	Cl. 2.2.15	No performance assessed
Render strip tensile test	Cl. 2.2.17	No performance assessed
Bond strength after ageing of finishing coat tested on the rig	Cl. 2.2.20.1	See cl. 3.3.5
Bond strength after ageing of finishing coat not tested on the rig	Cl. 2.2.20.2	See cl. 3.3.6

Essential characteristic	Assessment method (EAD clause)	Performance
Tensile strength of the glass fibre mesh	Cl. 2.2.21.1 Cl. 2.2.21.2	See cl. 3.3.7
Airborne sound insulation of ETICS	Cl. 2.2.22.1	No performance assessed
Dynamic stiffness of the thermal insulation product	Cl. 2.2.22.2	No performance assessed
Air flow resistance of the thermal insulation product	Cl. 2.2.22.3	No performance assessed
Thermal resistance and thermal transmittance of ETICS	Cl. 2.2.23	See cl. 3.3.8
Thermal resistance of the thermal insulation product		

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire of ETICS

Table 4

Reaction to fire of ETICS: B-s1, d0	
Component	Applies to ETICS meeting requirements:
Adhesive	VIVEFLEX 200W
Thermal insulation product	In accordance with Table 1 with max. apparent density (EN 1602): 20 kg/m ³
Anchors	In accordance with Table 1
Base coat	VIVEFLEX 200W
Reinforcement	THERMOPROTECT ΥΑΛΟΠΛΕΓΜΑ
Key coat	TOP BOND PRIMER or STRONG GRIP PRIMER
Finishing coat	TOP ACRYLIC 1.0 or TOP ACRYLIC 1.5 or TOP ACRYLIC 2.0 or TOP SILICONE 1.0

3.2 Hygiene, health and the environment (BWR 3)

3.2.1 Water absorption of the base coat and the rendering system

Table 5

Water absorption of the reinforced base coat		
Applies to ETICS meeting requirements:	After 1 h [kg/m ²]	After 24 h [kg/m ²]
Base coat		
VIVEFLEX 200W	0.059	0.368

Table 6

Water absorption of the complete rendering				
Applies to ETICS meeting requirements:			After 1 h [kg/m ²]	After 24 h [kg/m ²]
Base coat	Finishing coat	Key coat		
VIVEFLEX 200W	TOP ACRYLIC 1.0 or TOP ACRYLIC 1.5 or TOP ACRYLIC 2.0	In accordance with Table 1	0.056	0.304
VIVEFLEX 200W	TOP SILICONE 1.0	In accordance with Table 1	0.078	0.201

3.2.2 Water-tightness of the ETICS: hygrothermal behaviour

Table 7

Water-tightness of the ETICS: hygrothermal behaviour
Hygrothermal cycles have been performed on a rig. The ETICS passed the test without defects and is assessed as resistant to hygrothermal cycles .

3.2.3 Water-tightness: freeze thaw performance

Table 8

Water-tightness: freeze thaw performance
The ETICS is freeze-thaw resistant , because the water absorption of both, reinforced base coat and the rendering system, are less than 0.5 kg/m ² after 24 hours.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Bond strength between the base coat and the thermal insulation product (mortar or paste)

Table 9

Bond strength between the base coat and the thermal insulation product (mortar or paste)					
Applies to ETICS meeting requirements:		Conditioning before the test	Rupture type	Bond strength [kPa]	
Insulation product	Base coat			Min.	Mean
In accordance with Table 1	VIVEFLEX 200W	Initial state (dry condition)	In the insulation product	172	178
In accordance with Table 1	VIVEFLEX 200W	After hygrothermal cycles	In the insulation product	166	179

3.3.2 Bond strength between the adhesive and the substrate

Table 10

Bond strength between the adhesive and the substrate						
Applies to ETICS meeting requirements:		Conditioning before the test	Tested thickness of adhesive [mm]	Rupture type	Bond strength [kPa]	
Substrate	Adhesive (tested thickness)				Min.	Mean
Concrete	VIVEFLEX 200W (3-4 mm)	Initial state (dry condition)	3 - 5	In the adhesive	940	1153
Concrete	VIVEFLEX 200W (3-4 mm)	2 days immersion and 2 hours drying	3 - 5	In the adhesive	830	989
Concrete	VIVEFLEX 200W (3-4 mm)	2 days immersion and min. 7 days drying	3 - 5	In the adhesive	1854	2415

3.3.3 Bond strength between the adhesive and the thermal insulation product

Table 11

Bond strength between the adhesive and the thermal insulation product						
Applies to ETICS meeting requirements:		Conditioning before the test	Tested thickness of adhesive [mm]	Rupture type	Bond strength [kPa]	
Insulation product	Adhesive (tested thickness)				Min.	Mean
In accordance with Table 1	VIVEFLEX 200W (3-4 mm)	Initial state (dry condition)	3 - 5	In the insulation product	166	171
In accordance with Table 1	VIVEFLEX 200W (3-4 mm)	2 days immersion and 2 hours drying	3 - 5	In the insulation product	106	112
In accordance with Table 1	VIVEFLEX 200W (3-4 mm)	2 days immersion and min. 7 days drying	3 - 5	In the insulation product	152	165

3.3.4 Wind load resistance of ETICS – pull-through tests of fixings

Table 12

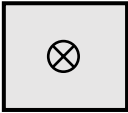
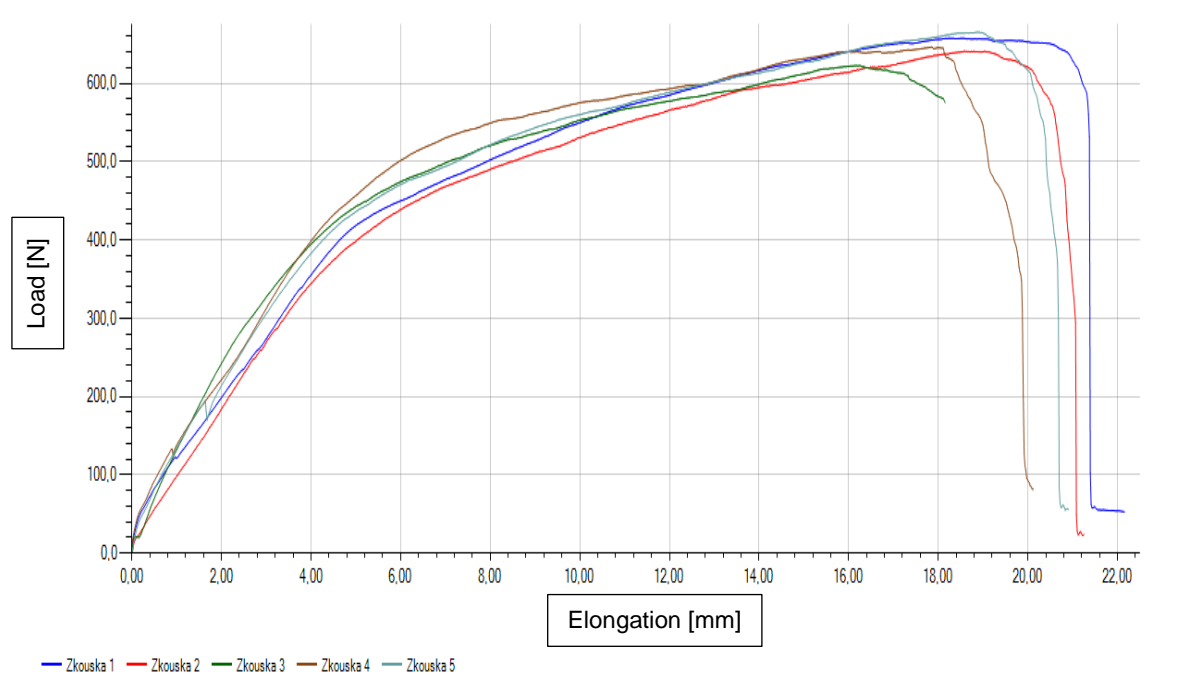
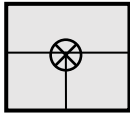
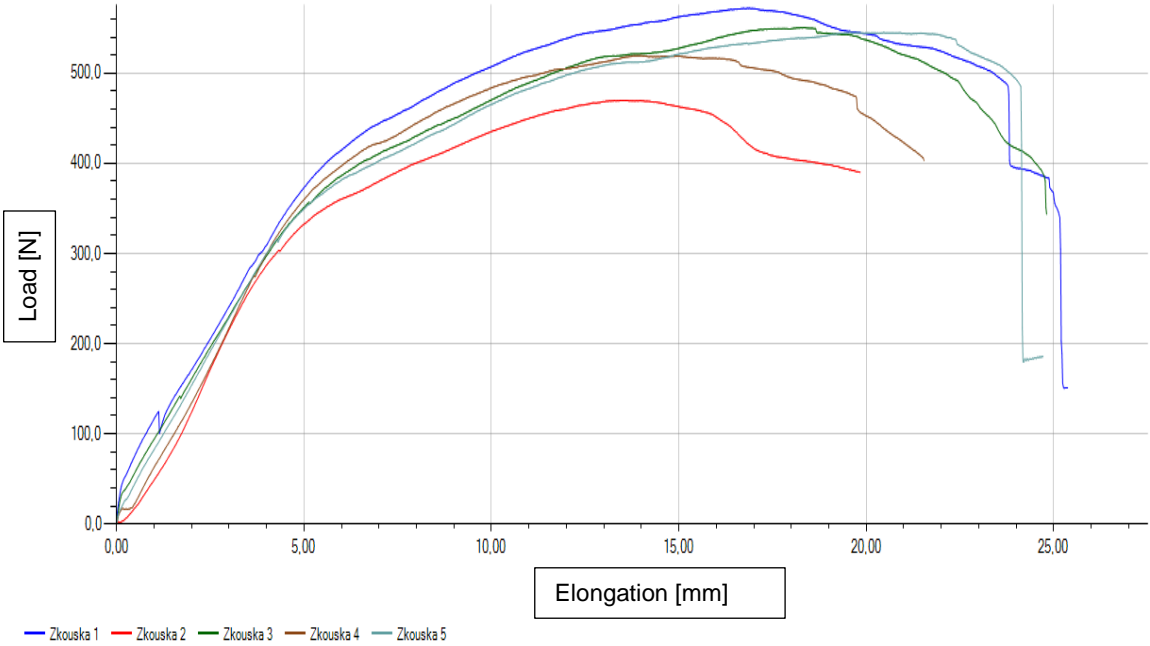
Wind load resistance of ETICS					
Assessed by means of: pull-through tests of fixings					
Applies to ETICS meeting requirements:		Tested position	Test conditions	Failure load per fixing [kN]	
Insulation product	Fixing			Individual	Mean
In accordance with Table 1 and Thickness: ≥ 50 mm or ≥ 100 mm for countersunk assembly and Tensile strength in dry condition: ≥ 196 kPa	Surface assembly or countersunk assembly (incision depth max. 20 mm) Anchors in accordance with Table 1 and Plate diameter: ≥ 60 mm and Plate stiffness: ≥ 0.5 mm	R_{panel} 	Dry condition 23 °C and 50 % relative humidity of air	0.658 0.641 0.623 0.647 0.666	0.647
Load / displacement graph:					
					

Table 13

Wind load resistance of ETICS					
Assessed by means of: pull-through tests of fixings					
ETICS configuration requirements:		Tested position	Test conditions	Failure load per fixing [kN]	
Insulation product	Fixing			Individual	Mean
In accordance with Table 1 and Thickness: ≥ 50 mm or ≥ 100 mm for countersunk assembly and Tensile strength in dry condition: ≥ 196 kPa	Surface assembly or countersunk assembly (incision depth max. 20 mm) Anchors in accordance with Table 1 and Plate diameter: ≥ 60 mm and Plate stiffness: ≥ 0.5 mm	R_{joint} 	Dry condition 23 °C and 50 % relative humidity of air	0.572 0.470 0.551 0.520 0.545	0.532
Load / displacement graph:					
					

3.3.5 Bond strength after ageing of finishing coat tested on the rig

Table 14

Bond strength after ageing of finishing coat tested on the rig						
Applies to ETICS meeting requirements:				Rupture type	Bond strength [kPa]	
Insulation product	Base coat	Finishing coat	Key coat		Individual	Mean
In accordance with Table 1	VIVEFLEX 200W	TOP ACRYLIC 1.0	In accordance with Table 1	In the insulation product	176	182
				In the insulation product	185	
				In the insulation product	177	
				In the insulation product	190	
				In the insulation product	181	
In accordance with Table 1	VIVEFLEX 200W	TOP SILICONE 1.0	In accordance with Table 1	In the insulation product	203	187
				In the insulation product	188	
				In the insulation product	181	
				In the insulation product	189	
				In the insulation product	172	

3.3.6 Bond strength after ageing of finishing coat not tested on the rig

Table 15

Bond strength after ageing of finishing coat not tested on the rig						
Applies to ETICS meeting requirements:				Rupture type	Bond strength [kPa]	
Insulation product	Base coat	Finishing coat	Key coat		Individual	Mean
In accordance with Table 1	VIVEFLEX 200W	TOP ACRYLIC 1.5 or TOP ACRYLIC 2.0	In accordance with Table 1	In the insulation product	166	170
				In the insulation product	175	
				In the insulation product	160	
				In the insulation product	180	
				In the insulation product	167	

3.3.7 Tensile strength of the glass fibre mesh

Table 16

Tensile strength of the glass fibre mesh										
Applies to ETICS meeting requirements:	As-delivered state				After alkali ageing					
	Tensile strength [N/mm]		Elongation [%]		Tensile strength [N/mm]		Residual tensile strength [%]		Elongation [%]	
Reinforcement	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft
THERMOPROTECT ΥΑΛΟΠΛΕΓΜΑ	44.1	46.5	3.33	3.08	>20	>20	>50	>50	1.64	1.69

3.3.8 Thermal resistance and thermal transmittance of ETICS and Thermal resistance of the thermal insulation product

Table 17

Thermal resistance and thermal transmittance of ETICS (R_{ETICS})	
Thermal resistance	$[(m^2 \cdot K)/W]$
R_{render}	0.02
R_{ETICS}	≥ 1.00
See Annex No. 1 for information on calculation of thermal transmittance of ETICS	

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

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

Table 18

Product	Intended uses	Class(es) (reaction to fire)	Systems of assessment and verification of constancy of performance
External thermal insulation composite system/kits with rendering (ETICS)	in external wall subject to fire regulations	A⁽¹⁾ – B⁽¹⁾ – C⁽¹⁾	1
		A⁽²⁾ – B⁽²⁾ – C⁽²⁾ A (without testing) D – E – F	2+
	in external wall not subject to fire regulations	any	2+
⁽¹⁾ Materials for which the reaction to fire performance is susceptible to change during the production process ⁽²⁾ Materials for which the reaction to fire performance is not susceptible to change during the production process			

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD: 040083-00-0404

The manufacturer and the Technical and Test Institute for Construction Prague have agreed a Control Plan which is deposited with the Technical and Test Institute for Construction Prague in documentation which accompanies the ETA. The Control Plan specifies the type and frequency of checks/tests conducted on raw materials, during production on manufactured components and on the final product.

The manufacturer has defined special techniques of installation that shall always be followed. Installation shall be done by qualified personnel in accordance with the special installation techniques defined by the manufacturer.

Notified body carries out initial inspection of the manufacturing plant and of factory production control and continuous surveillance, assessment and evaluation of factory production control once per year.

Issued in Prague on 10/05/2021

by

Ing. Mária Schaan

Head of the Technical Assessment Body (TAB)

Annexes:

- Annex No. 1 Thermal transmittance of ETICS
- Annex No. 2 Thermal insulation product – expanded polystyrene (EPS)
- Annex No. 3 Mechanical fixing device – anchors
- Annex No. 4 Reinforcement – glass fibre mesh

Annex No. 1 Thermal transmittance of ETICS

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

U_c is corrected thermal transmittance of the entire wall, including thermal bridges.

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

ΔU is correction term of the thermal transmittance for mechanical fixing devices.

$$U = \frac{1}{R_{ETICS} + R_{substrate} + R_{se} + R_{si}} [W/m^2 \cdot K]$$

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

Where: $R_{insulation}$ = insulation thickness / thermal conductivity coefficient [$m^2 \cdot K/W$]

R_{render} = 0.02 [$m^2 \cdot K/W$]

$R_{substrate}$ thermal transmittance of the substrate wall [$m^2 \cdot K/W$].

R_{se} external surface thermal resistance [$m^2 \cdot K/W$].

R_{si} internal surface thermal resistance [$m^2 \cdot K/W$].

$$\Delta U = \chi_P \times n + \sum \Psi_i \times l_i [m^2 \cdot K/W]$$

Where: χ_P is point thermal transmittance value of the anchor [W/K]. Specified by the ETA for anchors or as follows:

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 (the worst case).

n is number of anchors per m^2 . In case n is more than 16, the U_c calculation does not apply.

Ψ_i is linear thermal transmittance value of the profile [$W/m \cdot K$].

l_i is length of the profile per m^2 .

The influence of thermal bridges can also be calculated as described in EN ISO 10211. If there are more than 16 pcs of anchors per m^2 the declared χ_P shall not be used. The EN ISO 10211 calculation shall be used in such case.

Annex No. 2 Thermal insulation product – expanded polystyrene (EPS)

Factory made expanded polystyrene	
Generic type	
Requirements:	
Harmonized technical specification:	EN 13163
Composite insulation product:	No
Multi-layered insulation product	No
Facing or coating:	No
Content of graphite:	Yes
Reaction to fire of thermal insulation material:	E
Max. thermal conductivity coefficient λ_D :	max. 0.036 W/(m·K)
Thermal resistance:	min. 1.0 (m ² ·K)/W
Short-term water absorption:	max. 1.0 kg/m ²
Length:	L(2) ± 2 mm
Width:	W(1) ± 1 mm
Thickness:	T(1) ± 1 mm
Squareness in the direction of length and width:	S(2) ± 2 mm/m
Flatness:	P(5) 5 mm
Dimensional stability:	DS(N)
Water vapour permeability of thermal insulation product (water-vapour resistance factor) μ :	MU 70 max. 70 [-]
Tensile test perpendicular to the faces of the thermal insulation product – in dry conditions:	TR 150 min. 150 kPa
Shear strength:	SS20 min. 20 kPa
Shear modulus:	GM1000 min. 1000 kPa

Annex No. 3 Mechanical fixing device – anchors

Plastic anchors for fixing external thermal insulation composite systems with rendering	
Generic type	
Requirements:	
Harmonized technical specification:	ETAG 014 or EAD 330196-00-0604 or EAD 330196-01-0604 or superseding harmonized technical specification
Setting:	to be screwed-in or nailed-in and: 1) to be installed flush with the insulation product without or with an additional, flat, plate 2) to be installed countersunk to the surface of the insulation product, without an additional plate (incision depth max. 20 mm)
Diameter of the anchor plate:	min. 60 mm
Load resistance of the anchor plate:	min. 1.09 kN
Plate stiffness:	min. 0.5 kN/mm
Material of the nail	plastics or metal

Annex No. 4 Reinforcement – glass fibre mesh

Standard glass fibre mesh	
Specific type THERMOPROTECT ΥΑΛΟΠΛΕΓΜΑ	
Requirements:	
Harmonized technical specification:	040016-00-0404 or 040016-01-0404 or superseding harmonized technical specification
Mass per unit area	0.154 to 0.166 kg/m ²
Mesh size:	in warp direction: 4.1 – 5.1 mm in weft direction: 3.6 – 4.6 mm
Tensile strength in the as-delivered state	in warp direction: 40.0 N/mm in weft direction: 40.0 N/mm
Elongation in the as-delivered state	in warp direction: max. 3.33 % in weft direction: max. 3.08 %
Tensile strength after alkaline conditioning	in warp direction: min. 20.0 N/mm in weft direction: min. 20.0 N/mm
Residual tensile strength after alkaline ageing	in warp direction: min. 50.0 % in weft direction: min. 50.0 %
Elongation after alkaline ageing	in warp direction: max. 1.64 % in weft direction: max. 1.69 %