



**Technical and Test Institute
for Construction Prague**
Prosecká 811/76a
190 00 Praha
Czech Republic
eota@tzus.cz



European Technical Assessment

**ETA 16/0861
of 03/11/2018**

I General Part

Technical Assessment Body issuing the European Technical Assessment:
Technical and Test Institute for Construction Prague

Trade name of the construction product **MAJSTERPOL NATURAL**

Product family to which the construction product belongs Product area code: 4
External Thermal Insulation Composite Systems (ETICS) with rendering insulation product - expanded polystyrene (EPS)

Manufacturer MAJSTER-POL Spółka z ograniczoną odpowiedzialnością Spółka komandytowa
Mienia 291
05-319 Ceglów

Manufacturing plant <http://majsterpol.pl/>
MAJSTER-POL Spółka z ograniczoną odpowiedzialnością Spółka komandytowa
Mienia 291
05-319 Ceglów

This European Technical Assessment contains 26 pages including 4 Annexes which form an integral part of this Assessment.
Annex No. 5 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
This version replaces: ETAG 004 used as EAD, 2013
External thermal Insulation Composite Systems (ETICS) with rendering
ETA 16/0861, version 1, issued on 19/10/2016

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

II Specific part

1 Technical description of the product

1.1 Definition and composition of the kit

This product 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 expanded polystyrene (EPS) to be bonded or mechanically fixed onto a wall. The methods of fixing and the relevant components are specified in the table below. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering system is applied directly to the insulating boards, 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, 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.

Composition of the ETICS

Table No. 1

	Components	Coverage [kg/m ²]	Thickness [mm]
Insulation products with associated methods of fixing	Bonded ETICS (fully or partially bonded) with or without supplementary anchors. National application documents shall be taken into account.		
	<ul style="list-style-type: none">Insulation product: EPS according to EN 13163 see Annex No. 1 for product characteristics	/	50 - 300
	<ul style="list-style-type: none">Adhesives: min. bonded surface: 40 %<ul style="list-style-type: none">- STYROLEP K- (portland cement and special fine additives requiring addition of water 0.25 l/kg)	3.0 to 4.5 (dry)	/

	Components	Coverage [kg/m ²]	Thickness [mm]
Insulation products with associated methods of fixing	Mechanically fixed ETICS with anchors and supplementary adhesive (see Cl. 3.3.5 and Annex No. 2 for possible associations EPS/anchors) National application documents shall be taken into account.		
	<ul style="list-style-type: none"> Insulation product: EPS according to EN 13163 see Annex No. 1 for product characteristics 	/	50 - 300
	<ul style="list-style-type: none"> Supplementary adhesives: min. bonded surface: 30 % <ul style="list-style-type: none"> STYROLEP K (portland cement and special fine additives requiring addition of water 0.25 l/kg) 	3.0 to 4.5 (dry)	/
	<ul style="list-style-type: none"> Anchors see Annex No. 2 for individual product characteristics. In addition to the following list. Other anchors can be used provided that they comply with the requirements introduced in the Annex No. 2. 		
	<ul style="list-style-type: none"> Ejotherm NTK U plastic nailed-in anchors Ejotherm STR U, STR U 2G plastic screw-in anchors EJOT H3 plastic nailed-in anchors Bravoll PTH-KZ 60/8-La, Bravoll PTH 60/8-La, plastic nailed-in anchors Bravoll PTH-S 60/8-La plastic screw-in anchors Bravoll PTH-SX plastic screw-in anchors Bravoll PTH-X, PTH-EX plastic nailed-in anchors KEW TSD 8 plastic nailed-in anchors KEW TSD-V 8 plastic nailed-in anchors KEW TSDL-V plastic nailed-in anchors KOELNER TFIX-8M plastic nailed-in anchors LFM- 8 plastic nailed-in anchors WK THERM S plastic nailed-in anchors fischer TERMOZ 8U, 8UZ plastic screw-in anchors fischer TERMOZ CS 8 plastic screw-in anchors fischer TERMOZ 8SV plastic screw-in anchors 	ETA-07/0026 ETA-04/0023 ETA-14/0130 ETA-05/0055 ETA-08/0267 ETA-10/0028 ETA-13/0951 ETA-04/0030 ETA-08/0315 ETA-12/0148 ETA-07/0336 ETA-17/0450 ETA-13/0724 ETA-02/0019 ETA-14/0372 ETA-06/0180	

	Components	Coverage [kg/m ²]	Thickness [mm]
Insulation products with associated methods of fixing	- fischer TERMOFIX CF 8 plastic nailed-in anchors	ETA-07/0287	
	- Hilti SDK - FV plastic nailed-in anchors	ETA-07/0302	
Base coat	• STYROLEP Z portland cement and special fine additives requiring addition of water 0.25 l/kg	3.0 to 4.0 (dry matter)	3.0
	• STYROLEP Z BIAŁY portland cement and special fine additives requiring addition of water 0.25 l/kg	3.0 to 4.0 (dry matter)	3.0
Reinforcement	• Standard mesh applied in single layer see Annex No. 3 for product characteristics:		
	- AKE 145 A	/	/
	- TG-22	/	/
	- Artikel 03-43	/	/
	- 122	/	/
	- 117S	/	/
	- Fiberglass Fabrics FF 145	/	/
Key coat	- MASTER BRICK GROUND - to be used with MASTER BRICK - pigmented ready to use liquid	0.25 – 0.30	0.05 – 0.10
	- MAJSTERGRUNT PODTYNKOWY SILIKONOWY - to be used with MASTER POLI - pigmented ready to use liquid	0.25	0.05 – 0.10
Finishing coats	• Ready to use paste - based on silicone binder: - MASTER POLI - floated structure - particle size 0.5 mm	1.2 – 1.5	1.0
Finishing coats	• Ready to use paste - based on acrylic binder: - MASTER BRICK - floated structure - particle size 0.5 mm	1.6 – 1.8	1.0
	• <u>MASTER BRICK shall always be used with finishing paint MASTER TONE</u>		

	Components	Coverage [kg/m ²]	Thickness [mm]
Topcoat finish	<ul style="list-style-type: none"> - MASTER TONE - to be used with MASTER BRICK - ready to use - aqueous acrylic lacquer, the composition is water, acrylic binder, defoamer, preservative, thickener polyurethane 	0.10 – 0.12 (in two coats)	0.10 – 0.15
Ancillary materials	Remain under the manufacturer's responsibility		

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

2.1 Intended use

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 characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classification and for fixing of the ETICS either by bonding or mechanically. The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation.

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 can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

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

The choice of the method of fixing depends on the characteristics of the substrate, which may need preparation (see cl. 7.2.1 of the ETAG 004) and shall be done in accordance with the national instructions.

The ETICS belong to Category SW2, according to EOTA Technical Report No 034.

2.2 Manufacturing

The European Technical Assessment is issued for the ETICS on the basis of agreed data/information, deposited with the Technical and Test Institute Prague, which identifies the ETICS that has been assessed and judged.

2.3 Design and installation

The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

Design, installation and execution of ETICS are to be in conformity with national documents. Such documents and the level of their implementation in Member States' legislation are different. Therefore, the assessment and declaration of performance are done taking into account general assumptions introduced in the chapters 7.1 and 7.2 of ETAG 004 used as EAD, which summarize how information introduced in the ETA and related documents is intended to be used in the construction process and gives advice to all parties interested when normative documents are missing.

2.4 Packaging, transport and storage

The information on packaging, transport and storage is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) to ensure that this information is made known to the concerned people.

2.5 Use, maintenance and repair

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.

The finishing coat shall normally be maintained in order to fully preserve the ETICS performance. Maintenance includes at least:

- visual inspection of the ETICS,
- repairing of localized damaged areas due to accidents,
- the aspect maintenance with products adapted and compatible with the ETICS (possibly after washing or ad hoc preparation).

Necessary repairs should be performed as soon as the need has been identified.

It is important to be able to carry out maintenance as far as possible using readily available products and equipment, without spoiling appearance. Only products which are compatible with the ETICS shall be used.

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) to ensure that this information is made know to the concerned people.

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 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 No. 2

Configuration	Organic content / heat of combustion	Flame retardant content	Euroclass according to EN 13501-1
Adhesive	- / max. 0.37 MJ/kg	No flame retardant	B – s1, d0
Boards of expanded polystyrene EPS Maximum density of 20 kg/m ³	/	In quantity ensuring Euroclass E according to EN 13501-1	
Base coat render	- / max. 0.48 MJ/kg	No flame retardant	
Glass fibre mesh	- / max. 8.40 MJ/kg	No flame retardant	
Finishing coats with acrylic binder Finishing coats with silicone binder	- / max. 2.80 MJ/kg	No flame retardant	
Protective paint:	- / max. 7.39 MJ/kg	No flame retardant	

Note: A 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 (e.g. on the basis of a large scale test) 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 **STYROLEP Z**:

Water absorption after 1 hour < 1 kg/m²

Water absorption after 24 hours < 0.5 kg/m²

- Rendering system:

Table No. 3

Rendering system: base coat STYROLEP Z + reinforcement and finishing coats indicated hereafter	Water absorption after 24 hours	
	< 0.5 kg/m ²	≥ 0.5 kg/m ²
MASTER POLI	X	
MASTER BRICK	X	
MASTER BRICK + MASTER TONE	X	

- Base coat **STYROLEP Z BIAŁY**:

Water absorption after 1 hour < 1 kg/m²

Water absorption after 24 hours < 0.5 kg/m²

- Rendering system:

Table No. 4

Rendering system: base coat STYROLEP Z BIAŁY + reinforcement and finishing coats indicated hereafter	Water absorption after 24 hours	
	< 0.5 kg/m ²	≥ 0.5 kg/m ²
MASTER POLI	X	
MASTER BRICK	X	
MASTER BRICK + MASTER TONE	X	

3.2.2 Watertightness (ETAG 004 - clause 5.1.3.2)

3.2.2.1 Hygrothermal behaviour

Pass (without defects).

3.2.2.2 Freeze-thaw behaviour

Freeze-thaw resistant - according to the water absorption test result.

Finishing coats that proved to have water absorption value, in accordance with the water absorption test, after 24 hours lower than 0.5 kg/m² were assessed as freeze-thaw resistant.

3.2.3 Impact resistance (ETAG 004 - clause 5.1.3.3)

Table No. 5

Render coating: base coat STYROLEP Z + reinforcement and finishing coats listed hereafter:	Single standard mesh
MASTER POLI	Category II
MASTER BRICK	Category II
MASTER BRICK + MASTER TONE	Category II

Table No. 6

Render coating: base coat STYROLEP Z BIALY + reinforcement and finishing coats listed hereafter:	Single standard mesh
MASTER POLI	Category II
MASTER BRICK	Category II
MASTER BRICK + MASTER TONE	Category II

3.2.4 Water vapour permeability (ETAG 004 - clause 5.1.3.4)

Table No. 7

Rendering system: base coat STYROLEP Z + reinforcement and finishing coats indicated hereafter	Equivalent air layer thickness s_d
	Single standard mesh
MASTER POLI	0.13
MASTER BRICK	0.15
MASTER BRICK + MASTER TONE	0.21

Table No. 8

Rendering system: base coat STYROLEP Z BIAŁY + reinforcement and finishing coats indicated hereafter	Equivalent air layer thickness s_d
	Single standard mesh
MASTER POLI	0.13
MASTER BRICK	0.15
MASTER BRICK + MASTER TONE	0.21

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

Kit not assessed according to EOTA TR 034.

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 **STYROLEP Z**:
 - Initial state: bond strength ≥ 0.080 MPa and a cohesive failure in the insulation product.
 - After hygrothermal cycles: bond strength ≥ 0.105 MPa and cohesive failure in the insulation product.
 - After freeze-thaw cycles: test not required (see Cl. 3.2.1 of this ETA).

- Base coat **STYROLEP Z BIAŁY**:
 - Initial state: bond strength ≥ 0.080 MPa and a cohesive failure in the insulation product.
 - After hygrothermal cycles: bond strength ≥ 0.105 MPa and cohesive failure in the insulation product.
 - After freeze-thaw cycles: test not required (see Cl. 3.2.1 of this ETA).

3.3.2 Bond strength between adhesive and substrate / insulation product (ETAG 004 - clauses 5.1.4.1.2, 5.1.4.1.3)

Table No. 9

		Initial state	48 hrs. immersion in water + 2 hrs. 23°C/50% RH	48 hrs. immersion in water + 7 days 23°C/50% RH
STYROLEP K	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	Expanded polystyrene (EPS)	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 MPa

3.3.3 Bond strength after ageing (ETAG 004 - clauses 5.1.7.1)

- After ageing by hygrothermal cycles: bond strength ≥ 0.105 MPa and a cohesive failure in the insulation product
- After 7 days of immersion in water and 7 days of drying: ≥ 0.115 MPa and cohesive failure in insulation product
- After freeze-thaw cycles: test not required (see Cl. 3.2.2.21 of this ETA).

3.3.4 Fixing strength (ETAG 004 - clause 5.1.4.2)

Test not required (no limitation of ETICS length).

3.3.5 Wind load resistance (ETAG 004 - clause 5.1.4.3)

Table No. 10

Anchor description	Trade name		See Annex No. 2
			Surface assembly
	Plate diameter [mm]		60 or more
EPS characteristics	Thickness [mm]		≥ 50
	Tensile strength perpendicular to faces [kPa]		≥ 159.2 in dry condition
Maximal load	Anchors placed at the body of the insulation product	R_{panel}	min. value: 0.42 kN mean value: 0.44 kN
	Anchors placed at joints of the insulation product	R_{joint}	min. value: 0.35 kN mean value: 0.40 kN

Table No. 11

Anchor description	Trade name		See Annex No. 2	
			fischer Schlagdübel TERMOFIX CF 8 ETA-07/0287	Plate stiffness \geq 0.6
	Assembly method		Countersunk assembly	
	Plate diameter [mm]		60	60
EPS characteristics	Thickness [mm]		≥ 100	≥ 100
	Tensile strength perpendicular to faces [kPa]		≥ 159.2 in dry condition	≥ 153.5 in dry condition
Maximal load	Anchors placed at the body of the insulation product	R_{panel}	min. value: 0.69 kN mean value: 0.74 kN	min. value: 0.71 kN mean value: 0.76 kN
	Anchors placed at joints of the insulation product	R_{joint}	min. value: 0.61 kN mean value: 0.62 kN	min. value: 0.68 kN mean value: 0.73 kN

3.3.6 Render strip tensile test

- Base coat **STYROLEP Z**:

Table No. 12

load direction		Glass fibre mesh AKE 145 A (VERTEX R 117 A101) (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)					
		crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ					
		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 1.5 \%$	$\epsilon = 2.0 \%$
warp	sample No. 1	-	$\leq 0.05/2$	$\leq 0.05/8$	$\leq 0.05/13$	$\leq 0.05/15$ $\leq 0.10/2$	$\leq 0.05/17$ $\leq 0.10/6$ $\leq 0.15/1$
	sample No. 2	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/13$	$\leq 0.05/15$ $\leq 0.10/2$	$\leq 0.05/18$ $\leq 0.10/4$ $\leq 0.15/3$
	sample No. 3	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/14$	$\leq 0.05/16$ $\leq 0.10/3$	$\leq 0.05/20$ $\leq 0.10/5$ $\leq 0.15/3$
weft	sample No. 1	-	$\leq 0.05/3$	$\leq 0.05/6$	$\leq 0.05/16$	$\leq 0.05/17$ $\leq 0.10/2$	$\leq 0.05/19$ $\leq 0.10/6$ $\leq 0.15/4$
	sample No. 2	-	$\leq 0.05/3$	$\leq 0.05/7$	$\leq 0.05/16$	$\leq 0.05/18$ $\leq 0.10/2$	$\leq 0.05/20$ $\leq 0.10/7$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/2$	$\leq 0.05/8$	$\leq 0.05/15$	$\leq 0.05/21$ $\leq 0.10/2$	$\leq 0.05/21$ $\leq 0.10/5$ $\leq 0.15/3$

Table No. 13

		Glass fibre mesh TG-22 (manufacturer: Textilglas Polska Sp. z o.o.)					
		crack width W_{typ} [mm]/ number of cracks at relative elongation ε					
load direction		$\varepsilon = 0.3 \%$	$\varepsilon = 0.5 \%$	$\varepsilon = 0.8 \%$	$\varepsilon = 1.0 \%$	$\varepsilon = 1.5 \%$	$\varepsilon = 2.0 \%$
warp	sample No. 1	-	$\leq 0.05/2$	$\leq 0.05/7$	$\leq 0.05/12$	$\leq 0.05/17$ $\leq 0.10/1$	$\leq 0.05/21$ $\leq 0.10/6$ $\leq 0.15/1$
	sample No. 2	-	$\leq 0.05/3$	$\leq 0.05/10$	$\leq 0.05/13$	$\leq 0.05/17$ $\leq 0.10/3$	$\leq 0.05/22$ $\leq 0.10/5$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/5$	$\leq 0.05/9$	$\leq 0.05/14$	$\leq 0.05/17$ $\leq 0.10/3$	$\leq 0.05/21$ $\leq 0.10/6$ $\leq 0.15/2$
weft	sample No. 1	-	$\leq 0.05/1$	$\leq 0.05/5$	$\leq 0.05/13$	$\leq 0.05/19$ $\leq 0.10/1$	$\leq 0.05/20$ $\leq 0.10/7$ $\leq 0.15/3$
	sample No. 2	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/16$	$\leq 0.05/19$ $\leq 0.10/4$	$\leq 0.05/24$ $\leq 0.10/5$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/1$	$\leq 0.05/10$	$\leq 0.05/14$	$\leq 0.05/19$ $\leq 0.10/4$	$\leq 0.05/23$ $\leq 0.10/8$ $\leq 0.15/3$

No performance assessed for glass fibre meshes **Artikel 03-43, 122, 117S, Fiberglass Fabrics FF 145 and Fiberglass Fabrics FF 160.**

The characteristic crack width W_{rk} [mm] at a render strain value of 0.8%, determined with simple Method II pursuant to ETAG 004, cl. 5.5.4.1.

Table No. 14

	Characteristic width of cracks W_{rk} [mm] at render strain value of 0.8%	
	Warp direction	Weft direction
AKE 145 A	0.050	0.050
TG-22	0.050	0.050
Artikel 03-43	No performance assessed	No performance assessed
122	No performance assessed	No performance assessed
117S	No performance assessed	No performance assessed
Fiberglass Fabrics FF 145	No performance assessed	No performance assessed
Fiberglass Fabrics FF 160	No performance assessed	No performance assessed

The width of cracks in reinforced base coat at 2% elongation is equal or lower than 0.15 mm.

- Base coat **STYROLEP Z BIAŁY:**

Table No. 15

		Glass fibre mesh AKE 145 A (VERTEX R 117 A101) (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)					
		crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ					
load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 1.5 \%$	$\epsilon = 2.0 \%$
warp	sample No. 1	-	$\leq 0.05/2$	$\leq 0.05/8$	$\leq 0.05/13$	$\leq 0.05/15$ $\leq 0.10/2$	$\leq 0.05/17$ $\leq 0.10/6$ $\leq 0.15/1$
	sample No. 2	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/13$	$\leq 0.05/15$ $\leq 0.10/2$	$\leq 0.05/18$ $\leq 0.10/4$ $\leq 0.15/3$
	sample No. 3	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/14$	$\leq 0.05/16$ $\leq 0.10/3$	$\leq 0.05/20$ $\leq 0.10/5$ $\leq 0.15/3$
weft	sample No. 1	-	$\leq 0.05/3$	$\leq 0.05/6$	$\leq 0.05/16$	$\leq 0.05/17$ $\leq 0.10/2$	$\leq 0.05/19$ $\leq 0.10/6$ $\leq 0.15/4$
	sample No. 2	-	$\leq 0.05/3$	$\leq 0.05/7$	$\leq 0.05/16$	$\leq 0.05/18$ $\leq 0.10/2$	$\leq 0.05/20$ $\leq 0.10/7$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/2$	$\leq 0.05/8$	$\leq 0.05/15$	$\leq 0.05/21$ $\leq 0.10/2$	$\leq 0.05/21$ $\leq 0.10/5$ $\leq 0.15/3$

Table No. 16

		Glass fibre mesh TG-22 (manufacturer: Textilglas Polska Sp. z o.o.)					
		crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ					
load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 1.5 \%$	$\epsilon = 2.0 \%$
warp	sample No. 1	-	$\leq 0.05/2$	$\leq 0.05/7$	$\leq 0.05/12$	$\leq 0.05/17$ $\leq 0.10/1$	$\leq 0.05/21$ $\leq 0.10/6$ $\leq 0.15/1$
	sample No. 2	-	$\leq 0.05/3$	$\leq 0.05/10$	$\leq 0.05/13$	$\leq 0.05/17$ $\leq 0.10/3$	$\leq 0.05/22$ $\leq 0.10/5$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/5$	$\leq 0.05/9$	$\leq 0.05/14$	$\leq 0.05/17$ $\leq 0.10/3$	$\leq 0.05/21$ $\leq 0.10/6$ $\leq 0.15/2$
weft	sample No. 1	-	$\leq 0.05/1$	$\leq 0.05/5$	$\leq 0.05/13$	$\leq 0.05/19$ $\leq 0.10/1$	$\leq 0.05/20$ $\leq 0.10/7$ $\leq 0.15/3$
	sample No. 2	-	$\leq 0.05/2$	$\leq 0.05/9$	$\leq 0.05/16$	$\leq 0.05/19$ $\leq 0.10/4$	$\leq 0.05/24$ $\leq 0.10/5$ $\leq 0.15/2$
	sample No. 3	-	$\leq 0.05/1$	$\leq 0.05/10$	$\leq 0.05/14$	$\leq 0.05/19$ $\leq 0.10/4$	$\leq 0.05/23$ $\leq 0.10/8$ $\leq 0.15/3$

No performance assessed for glass fibre meshes **Artikel 03-43, 122, 117S, Fiberglass Fabrics FF 145 and Fiberglass Fabrics FF 160.**

The characteristic crack width W_{rk} [mm] at a render strain value of 0.8%, determined with simple Method II pursuant to ETAG 004, cl. 5.5.4.1.

Table No. 17

	Characteristic width of cracks W_{rk} [mm] at render strain value of 0.8%	
	Warp direction	Weft direction
AKE 145 A	0.050	0.050
TG-22	0.050	0.050
Artikel 03-43	No performance assessed	No performance assessed
122	No performance assessed	No performance assessed
117S	No performance assessed	No performance assessed
Fiberglass Fabrics FF 145	No performance assessed	No performance assessed
Fiberglass Fabrics FF 160	No performance assessed	No performance assessed

The width of cracks in reinforced base coat at 2% elongation is equal or lower than 0.15 mm.

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation

No performance assessed.

3.5 Energy economy and heat retention (BWR 6)

3.5.1 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 ($R_{insulation}$), determined in accordance with clause 5.2.6.1 ETAG 004, and from the tabulated R_{render} value of the render system (R_{render} is about 0,02 m²K/W).

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

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:

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

where:

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

$$U = 1/[\text{R}_{\text{ETICS}} + \text{R}_{\text{SUBSTRATE}} + \text{R}_{\text{SE}} + \text{R}_{\text{SI}}]$$

$\text{R}_{\text{SUBSTRATE}}$ 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 = $\chi_p \cdot n$ (for anchors)

χ_p point thermal transmittance value of the anchor [W/K]. See EOTA Technical Report n°25. If not specified in the anchors ETA, the following values apply:

= 0.002 W/K for anchors with a plastic screw/nail, stainless steel screw/nail with the head covered by plastic material, and for anchors with an air gap at the head of the screw/nail

= 0.004 W/K for anchors with a galvanized steel screw/nail with the head covered by a plastic material

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

n number of anchors 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 χ_p -values given by the manufacturer do not apply in this case.

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 1 and 2+ are valid (further described in Annex V to Regulation (EU) No. 305/2011).

Table No. 18

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:

In order to help the Notified Body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information together with the requirements given in EC Guidance Paper B will generally form the basis on which the factory production control (FPC) is assessed by the Notified Body.

This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

1) ETA

Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.

2) Basic manufacturing process

The basic manufacturing process is described in sufficient detail to support the proposed FPC methods.

The different components of the ETICS are generally manufactured using conventional techniques. Any critical process or treatment of the components which affects performance are highlighted in the manufacturer's documentation.

3) Product and materials specifications

The manufacturer's documentation includes:

- detailed drawings (possibly including manufacturing tolerances),
- incoming (raw) materials specifications and declarations,
- references to European and/or international standards,
- technical data sheets.

4) Control Plan (as a part of FPC)

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 during production and on the final product. This includes the checks conducted during manufacture on properties that cannot be inspected at a later stage and for checks on the final product.

Products not manufactured by the ETICS manufacturer shall also be tested according to the Control Plan. It must be demonstrated to the Notified Body that the FPC system contains elements securing that the ETICS manufacturer takes products conforming to the Control Plan from his supplier(s).

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then where appropriate they shall be subject to suitable checks/tests by the ETICS manufacturer referring to the Control Plan once again.

In cases where the provisions of the European Technical Assessment and its Control Plan are no longer fulfilled, the Notified Body shall withdraw the certificate and inform the Technical and Test Construction Institute Prague without delay.

Issued in Prague on 03/11/2018



By
Ing. Mária Schaán

Head of the Technical Assessment Body

Annexes:

- | | |
|-------------|---|
| Annex No. 1 | Insulation product characteristics |
| Annex No. 2 | Anchors, description of individual product characteristics contained in the ETA |
| Annex No. 3 | Description of glass fibre mesh |
| Annex No. 4 | Variations of the trade names components of the ETICS |

Annex No. 1 Insulation product characteristics

Description and characteristics		Regulation	Declared characteristics of EPS boards	
			Class, level according to 13163	Value
Reaction to fire		EN 13501-1	E	Apparent density $\leq 20 \text{ kg/m}^3$
Thermal resistance		Defined in CE mark in accordance with EN 13163		
Thickness		EN 823	T(1)	$\pm 1 \text{ mm}$
Length		EN 822	L(2)	$\pm 2 \text{ mm}$
Width			W(2)	$\pm 2 \text{ mm}$
Squareness		EN 824	S(2)	$\pm 2 \text{ mm/m}$
Flatness		EN 825	P(5)	5 mm
Surface		ETAG 004	Cut surface (homogenous, without coating)	
Dimensional stability	Under defined temperature and humidity conditions	EN 1604	DS(70,-)2	2%
	Under constant laboratory conditions	EN 1603	DS(N)2	$\pm 0.2\%$
Short term water absorption at partial immersion		EN 1609	---	$< 1 \text{ kg/m}^2$
Diffusion factor (μ)		EN 13163	MU 20 – 40 MU 30 – 70	20 - 70
Tensile strength perpendicular to the faces of insulation product		EN 1607	TR100	$\geq 100 \text{ kPa}$
Shear strength		EN 12090	SS20	$\geq 20 \text{ kPa}$
Shear modulus of elasticity			GM1000	$\geq 1000 \text{ kPa}$

Note: Classes and levels for individual characteristics comply with EN 13163: 2012+A1:2015. Only insulation products of the same or better declared characteristics as stated in the table above can be used in this ETICS.

Reaction to fire E has to be proved for every insulation product also at 10 mm products thickness.

Annex No. 2 Anchors, description of individual product characteristics contained in the ETA

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
Surface assembly				
Ejotherm NTK U	60	See ETA-07/0026	0.50	1.44
Ejotherm STR U, STR U 2G	60	See ETA-04/0023	0.60	2.08
EJOT H3	60	See ETA-14/0130	0.60	1.25
BRAVOLL PTH-KZ 60/8-La	60	See ETA – 05/0055	0.70	2.10
BRAVOLL PTH-60/8-La			0.60	1.63
BRAVOLL PTH-S 60/8-La	60	See ETA - 08/0267	0.90	2.60
BRAVOLL PTH-SX	60	See ETA - 10/0028	0.70	1.80
BRAVOLL PTH-X	60	See ETA - 13/0951	0.60	1.50
BRAVOLL PTH-EX			0.60	1.40
KEW TSD 8	60	See ETA-04/0030	0.60	1.60
KEW TSD-V 8	60	See ETA-08/0315	1.20	1.75
KEW TSDL-V	60	See ETA-12/0148	1.20	1.75
KOELNER TFIX-8M	60	See ETA-07/0336	1.00	1.75
LFM-8	60	See ETA-17/0450	0.50	1.26
Klimas Wkret-med screw-in plug eco-drive	60	See ETA-13/0107	0.60	2.80
WK THERM S	60	See ETA-13/0724	0.60	4.30
fischer TERMOZ 8U	60	See ETA-02/0019	0.50	2.45
fischer TERMOZ 8UZ			0.50	1.43
fischer TERMOZ CS 8	60	See ETA-14/0372	0.60	1.70
fischer TERMOZ 8SV	60	See ETA-06/0180	1.10	2.13
fischer TERMOFIX CF 8	60	See ETA-07/0287	0.50	1.65
fischer termoz SV II ecotwist	60	See ETA-12/0208	0.96	1.90
Hilti SDK - FV	60	See ETA-07/0302	0.50	1.48

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
Countersunk assembly				
Ejothem STR U, STR U 2G	60	See ETA-04/0023	0.60	2.08
fischer TERMOZ 8 SV	60	See ETA-06/0180	1.10	2.13
BRAVOLL PTH-SX	60	See ETA-10/0028	0.50	1.80
KOELNER TFIX-8ST	60	See ETA-11/0144	0.60	2.04

In addition to this list, anchors with ETA according to EAD 330196-01-0604, EAD 330196-00-0604 or ETAG 014 can be used provided that such anchors meet the following requirements:

	Requirements	
Plate diameter	≥ 60 mm	
Plate stiffness	Surface assembly:	≥ 0.5 kN/mm
	Countersunk assembly:	≥ 0.5 kN/mm
Rupture force of anchor's plate	≥ Higher of figures R_{panel} and R_{joint} in relevant table in Cl. 3.3.5	

Annex No. 3 Description of glass fibre mesh

	Description	Strength after ageing	
	Standard fibre mesh applied in one or two layers with aperture size	Absolute strength after ageing [N/mm]	Relative residual strength after ageing, of the strength in the as-delivered state [%]
AKE 145 A	4.0 x 4.5 mm	≥ 20	≥ 50
TG-22	5.0 x 5.0 mm		
Artikel 03-43	3.6 x 4.9 mm		
117S	5.0 x 4.0 mm		
122	4.0 x 4.0 mm		
Fiberglass Fabrics FF 145	5.0 x 4.0 mm		
Fiberglass Fabrics FF 160	4.0 x 4.0 mm		

Annex 4 - variations of the trade names components of the ETICS

	Adhesive - Trade name
	STYROLEP K
trade name No. 2	MESTERPUDS SK
trade name No. 3	Meister K-Styroporkleber
	Base coat - Trade name
	STYROLEP Z
trade name No. 2	MESTERPUDS SZ
trade name No. 3	Meister Z-Armierungskleber
	STYROLEP Z BIAŁY
trade name No. 2	MESTERPUDS SZ HVID
trade name No. 3	
	Key coats - Trade name
	MASTER BRICK GROUND
trade name No. 2	
trade name No. 3	
	MAJSTERGRUNT PODTYNKOWY SILIKONOWY
trade name No. 2	MESTERGRUNDER SILIKONE
trade name No. 3	
	Finishing coats - Trade name
	MASTER POLI
trade name No. 2	
trade name No. 3	
	MASTER BRICK
trade name No. 2	
trade name No. 3	
	Topcoat finish - Trade name
	MASTER TONE
trade name No. 2	
trade name No. 3	