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Designated according to Article 29 of Regulation (EU) No. 305/2011

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European Technical Assessment

ETA-14/0238 of 21/11/2018

General Part

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

Trade name of the construction product	**MAJSTER POL MINERAL**
Product family to which the construction product belongs	Product area code: 4 External Thermal Insulation Composite Systems (ETICS) with rendering insulation product – mineral wool (MW)
Manufacturer	MAJSTER-POL Spółka z ograniczoną odpowiedzialnością Spółka komandytowa Mienia 291 05-319 Ceglów http://majsterpol.pl/
Manufacturing plant	MAJSTER-POL Spółka z ograniczoną odpowiedzialnością Spółka komandytowa Mienia 291 05-319 Ceglów
This European Technical Assessment contains	25 pages including 5 Annexes which form an integral part of this assessment. Annex No. 6 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 External thermal Insulation Composite Systems (ETICS) with rendering
This version replaces:	ETA 14/0238, version 01 issued on 21/07/2014

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

Specific parts

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 mineral wool (MW) 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 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.

Composition of the ETICS:

Table No. 1

	Components	Coverage (kg/m²)	Thickness (mm)
Insulation materials with associated methods of fixing	**Bonded ETICS with or without supplementary anchors.** **National application documents shall be taken into account.**		
	• Insulation product: MW according to EN 13162 see Annex No. 1 for product characteristics	/	50 – not limited
	• Adhesives: bonded surface area: 100 % - **WEŁNOLEP K** - cement based powder requiring addition of water – 0.25 l/kg)	4.0 to 5.0 (dry)	/
	Mechanically fixed ETICS with anchors and supplementary adhesive (see Cl. 3.3.5 and Annex No. 3 for possible associations MW/anchors) **National application documents shall be taken into account.**		
	• Insulation product: MW according to EN 13162 see Annex No. 2 for product characteristics	/	50 – not limited
	• Adhesives: bonded surface area: 40 % - **WEŁNOLEP K** - cement based powder requiring addition of water – 0.25 l/kg)	4.0 to 5.0 (dry)	/

	Components	Coverage (kg/m²)	Thickness (mm)
Insulation products with associated methods of fixing	• Anchors, see Annex No. 3 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. 3.		
	- **ejotherm STR U, ejotherm STR U 2G** plastic screw-in anchors	ETA-04/0023	
	- **EJOT SDM-T plus** plastic screw-in anchors	ETA-04/0064	
	- **ejotherm NT U** plastic nailed-in anchors	ETA-05/0009	
	- **EJOT H1 eco, EJOT H4 eco** plastic nailed-in anchors	ETA-11/0192	
	- **fischer TERMOZ 8SV** plastic screw-in anchors	ETA-06/0180	
	- **Bravoll PTH-KZ 60/8-La, Bravoll PTH 60/8-La** plastic nailed-in anchors	ETA-05/0055	
	- **Bravoll PTH-S 60/8-La** plastic screw-in anchors	ETA-08/0267	
	- **Bravoll PTH-X, PTH-EX** plastic nailed-in anchors	ETA-13/0951	
	- **WKTHERM ø 8** plastic screw-in anchors	ETA-11/0232	
	- **Fixplug 8, Fixplug 10** plastic nailed-in anchors	ETA-15/0373	
	- **KOELNER TFIX-8M** plastic nailed-in anchors	ETA-07/0336	
	- **KOELNER TFIX-8S** plastic screw-in anchors	ETA-11/0144	
	- **Plate anchor TTH 10/60-La** plastic nailed-in anchors	ETA-09/0318	
Base coat	• **WEŁNOLEP Z** - cement based powder requiring addition of 0.25 l/kg water	3.0 to 4.0 (dry mixture)	3
Reinforcement	• Standard mesh applied in single layer see Annex No. 3 for product characteristics: - **AKE 145 A** - **TG-22**	/ /	/ /

	Components	Coverage (kg/m²)	Thickness (mm)
Key coats	• **MAJSTERGRUNT PODTYNKOWY AKRYLOWY** - to be used with mineral/acrylic binder finishing coats - pigmented ready to use liquid	0.20	-
	• **MAJSTERGRUNT PODTYNKOWY SILIKATOWY** - to be used with silicate binder finishing coats - pigmented ready to use liquid	0.20	-
	• **MAJSTERGRUNT PODTYNKOWY SILIKONOWY** - to be used with silicone binder finishing coats - pigmented ready to use liquid	0.20	-
Finishing coats	• Ready to use paste - based on silicate binder:		
	- **MAJSTERTYNK SILIKATOWY KORNIK** - ribbed structure (particle size 1.5; 2.0; 2.5; 3.0 mm) - **MAJSTERTYNK SILIKATOWY BARANEK** - floated structure - (particle size 1.0;1.5; 2.0; 2.5 mm) - **MAJSTERTYNK Si-Si KORNIK** - ribbed structure (particle size 1.5; 2.0; 2.5; 3.0 mm) - **MAJSTERTYNK Si-Si BARANEK** - floated structure - (particle size 1.0;1.5; 2.0; 2.5 mm)	2.3 – 4.2 1.6 – 3.9	Regulated by particle size
	• Ready to use paste - based on silicone binder: - **MAJSTERTYNK SILIKONOWY KORNIK** - ribbed structure (particle size 1.5; 2.0; 2.5; 3.0 mm) - **MAJSTERTYNK SILIKONOWY BARANEK** - floated structure (particle size 1.0;1.5; 2.0; 2.5 mm)	2.3 – 4.2 1.6 – 3.9	
	• Cement based powder requiring addition of water - **MAJSTERTYNK MINERALNY KORNIK** - ribbed structure (particle size 1.5; 2.0; 2.5; 3.0 mm) - requiring addition of 24 % of water - **MAJSTERTYNK MINERALNY BARANEK** - floated structure (particle size 1.0;1.5; 2.0; 2.5 mm) - requiring addition of 24 % of water	2.3 – 4.2 1.6 – 3.9	
	- Mineral renderings shall always be used with finishing paint MAJSTERFARBA AKRYLOWA, MAJSTERFARBA SILIKATOWA, MAJSTERFARBA SILIKONOWA, MAJSTERFARBA Si-Si		

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• Ready to use paste - based on acrylic binder: - **MAJSTERTYNK AKRYLOWY KORNIK** - ribbed structure (particle size 1.5; 2.0; 2.5; 3.0 mm) - **MAJSTERTYNK AKRYLOWY BARANEK** - floated structure (particle size 1.0;1.5; 2.0; 2.5 mm) - **MAJSTERTYNK MOZAIKOWY** (particle size fine, medium and coarse)	2.3 – 4.2 1.6 – 3.9 3.0 – 5.0	Regulated by particle size
Protective paints	- Mineral MAJSTERTYNK MINERALNY KORNIK and MAJSTERTYNK MINERALNY BARANEK shall always be used with paint: - **MAJSTERFARBA AKRYLOWA** - to be used with mineral finishing coats - ready to use - pigmented styrene-acrylic dispersion - **MAJSTERFARBA SILIKATOWA** - to be used with mineral finishing coats - ready to use - pigmented styrene-acrylic dispersion, potassium water glass - **MAJSTERFARBA SILIKONOWA** - to be used with mineral finishing coats - ready to use - acrylic copolymer dispersion, silicone dispersion - **MAJSTERFARBA Si-Si** - to be used with mineral finishing coats ready to use - pigmented styrene-acrylic dispersion, silicone dispersion, potassium silicate solution	0.2 – 0.3 (in two coats)	0.05 – 0.10
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 S/W2, 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 1-4.

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	Heat of combustion / Organic content	Flame retardant content	Euroclass according to EN 13501-1
Adhesive	-	No flame retardant	**A2 – s1, d0**
	Max. 1.3 %		
Boards of mineral wool MW maximum density 150 kg/m^3	-	In quantity ensuring Euroclass A1 according to EN 13501-1	
Base coat render	-	No flame retardant	
	Max. 1.5 %		
Glass fibre mesh	Max. 6.96 MJ/kg	No flame retardant	
	Max. 20.0 %		
Finishing coats with acrylic binder Finishing coats with silicone binder Finishing coats with silicate binder Finishing coats with mineral binder	Max. 2.8 MJ/kg	No flame retardant	
	-		
Protective paints (used with mineral finishing coats): MAJSTERFARBA AKRYLOWA MAJSTERFARBA SILIKATOWA MAJSTERFARBA SILIKONOWA MAJSTERFARBA Si-Si	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 **WEŁNOLEP Z**:
  - Water absorption after 1 hour < 1 kg/m^2
  - Water absorption after 24 hours ≥ 0.5 kg/m^2
- Rendering systems:

Table No. 3

		Water absorption after 24 hours	
		< 0.5 kg/m^2	**≥ 0.5 kg/m^2**
Rendering systems: Base coat **WEŁNOLEP Z** + finishing coats indicated hereafter:	**MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA AKRYLOWA**		X
	MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA SILIKATOWA		X
	MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA SILIKONOWA		X
	MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA Si-Si		X
	MAJSTERTYNK SILIKONOWY KORNIK		X
	MAJSTERTYNK SILIKATOWY KORNIK		X
	MAJSTERTYNK Si-Si KORNIK		X
	MAJSTERTYNK MOZAIKOWY		X

3.2.2. Watertightness (ETAG 004 - clause 5.1.3.2)

3.3.2.1 Hygrothermal behaviour (ETAG 004 - clause 5.1.3.2.1)

Pass without defects.

3.3.2.1 Freeze-thaw behaviour (ETAG 004 - clause 5.1.3.2.2)

The ETICS has been tested for freeze/thaw behaviour in configurations comprising the following base coats and finishing coats:

Table No. 4

Base coat	Freeze-thaw behaviour
WEŁNOLEP Z	Pass (without defects)
Rendering systems: Base coat **WEŁNOLEP Z** + finishing coats indicated hereafter:	**Freeze-thaw behaviour**
MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA AKRYLOWA	Pass (without defects)
MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA SILIKATOWA	Pass (without defects)
MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA SILIKONOWA	Pass (without defects)
MAJSTERTYNK MINERALNY KORNIK + MAJSTERFARBA Si-Si	Pass (without defects)
MAJSTERTYNK SILIKONOWY KORNIK	Pass (without defects)
MAJSTERTYNK SILIKATOWY KORNIK	Pass (without defects)
MAJSTERTYNK Si-Si KORNIK	Pass (without defects)
MAJSTERTYNK MOZAIKOWY	Pass (without defects)

Finishing coats that proved to have water absorption value, in accordance with water absorption test, after 24 hours higher than 0.5 kg/m^2 were subjected to the freeze-thaw test and are assessed as freeze-thaw resistant.

3.2.3. Impact resistance (ETAG 004 - clause 5.1.3.3)

Table No. 5

Rendering system: Base coat **WEŁNOLEP Z** + reinforcement and finishing coats indicated hereafter:	**Single standard mesh**	
	Renderings with particle size ≥ 1,5 mm	**Renderings with particle size = 1,0 mm**
MAJSTERTYNK SILIKATOWY KORNIK	**Category III**	No performance assessed
MAJSTERTYNK MINERALNY KORNIK	**Category III**	
MAJSTERTYNK Si-Si KORNIK	**Category III**	
MAJSTRTYNK SILIKONOWY KORNIK	**Category III**	
MAJSTERTYNK MOZAIKOWY	**Category III**	

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

Table No. 6

Rendering system: Base coat **WEŁNOLEP Z** + reinforcement and finishing coats indicated hereafter:	**Equivalent air thickness s_d**
MAJSTERTYNK SILIKATOWY BARANEK	≤ 0.11 m
MAJSTERTYNK SILIKONOWY BARANEK	≤ 0.37 m
MAJSTERTYNK MINERALNY BARANEK	≤ 0.09 m
MAJSTERTYNK Si-Si BARANEK	≤ 0.12 m
MAJSTERTYNK MOZAIKOWY	≤ 0.22 m
Protective paints:	**Equivalent air thickness s_d**
MAJSTERFARBA AKRYLOWA	test result: 0.15 m
MAJSTERFARBA SILIKATOWA	test result: 0.09 m
MAJSTERFARBA SILIKONOWA	test result: 0.09 m
MAJSTERFARBA Si-Si	test result: 0.11 m

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)

- Initial state: bond strength ≥ 0.040 MPa but a cohesive failure in the insulation product
- After hygrothermal cycles: bond strength ≥ 0.018 MPa but a cohesive failure in the insulation product
- After freeze-thaw cycles: bond strength ≥ 0.043 MPa but a cohesive failure in the insulation product

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. 7

		Initial state	**48 hours immersion in water + 2 hours. 23°C/50% RH**	**48 hours immersion in water + 7 days 23°C/50% RH**
WEŁNOLEP K	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	< 0.08 MPa and failure in insulation product	< 0.03 MPa and failure in insulation product	< 0.08 MPa and failure in insulation product
		≥ 0.08 MPa failure in the insulation product	≥ 0.03 MPa failure in the insulation product	≥ 0.08 MPa failure in the insulation product

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

- After ageing by hygrothermal cycles: bond strength ≥ 0.018 MPa but a cohesive failure in the insulation product
- After 7 days of immersion in water and 7 days of drying: ≥ 0.039 MPa and a cohesive failure in the insulation product
- After freeze-thaw cycles: ≥ 0.032 MPa but a cohesive failure in the insulation product.

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)

Tensile strength requirements marked as (wet) are measured in accordance with ETAG 004, Cl. 5.2.4.1.2, 28 days of heat-moisture actions and apply only as requirement for R_{panel} and R_{joint} values (wet).

Table No. 8

Anchor description	Trade name		**see Annex No. 3**	
	Assembly method		Surface assembly	Countersunk assembly
	Plate diameter (mm)		60 or more	
Insulation product description	Thickness (mm)		≥ 50	≥ 100
	Tensile strength (kPa)		≥ 15.0 (dry) ≥ 6.0 (wet)	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} (dry)s	min. value: **0.56 kN** mean value: **0.61 kN**	
		R_{panel} (wet)s	min. value: **0.39 kN** mean value: **0.43 kN**	
	Anchors placed at joints of the insulation product	R_{joint} (dry)s	min. value: **0.48 kN** mean value: **0.52 kN**	
		R_{joint} (wet)s	min. value: **0.31 kN** mean value: **0.36 kN**	

3.3.6. Render strip tensile test

Table No. 9

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					
		ε = 0.3 %	ε = 0.5 %	ε = 0.8 %	ε = 1.0 %	ε = 1.5 %	ε = 2.0 %
warp	sample No. 1	-	≤ 0.05/2	≤ 0.05/8	≤ 0.05/13	≤ 0.05/15 ≤ 0.10/2	≤ 0.05/17 ≤ 0.10/6 ≤ 0.15/1
	sample No. 2	-	≤ 0.05/2	≤ 0.05/9	≤ 0.05/13	≤ 0.05/15 ≤ 0.10/2	≤ 0.05/18 ≤ 0.10/4 ≤ 0.15/3
	sample No. 3	-	≤ 0.05/2	≤ 0.05/9	≤ 0.05/14	≤ 0.05/16 ≤ 0.10/3	≤ 0.05/20 ≤ 0.10/5 ≤ 0.15/3
weft	sample No. 1	-	≤ 0.05/3	≤ 0.05/6	≤ 0.05/16	≤ 0.05/17 ≤ 0.10/2	≤ 0.05/19 ≤ 0.10/6 ≤ 0.15/4
	sample No. 2	-	≤ 0.05/3	≤ 0.05/7	≤ 0.05/16	≤ 0.05/18 ≤ 0.10/2	≤ 0.05/20 ≤ 0.10/7 ≤ 0.15/2
	sample No. 3	-	≤ 0.05/2	≤ 0.05/8	≤ 0.05/15	≤ 0.05/21 ≤ 0.10/2	≤ 0.05/21 ≤ 0.10/5 ≤ 0.15/3

Table No. 10

load direction		Glass fibre mesh TG-22 (manufacturer: Textilglas Polska Sp. z o.o.) crack width W_{typ} [mm]/ number of cracks at relative elongation ε					
		ε = 0.3 %	ε = 0.5 %	ε = 0.8 %	ε = 1.0 %	ε = 1.5 %	ε = 2.0 %
warp	sample No. 1	-	≤ 0.05/2	≤ 0.05/7	≤ 0.05/12	≤ 0.05/17 ≤ 0.10/1	≤ 0.05/21 ≤ 0.10/6 ≤ 0.15/1
	sample No. 2	-	≤ 0.05/3	≤ 0.05/10	≤ 0.05/13	≤ 0.05/17 ≤ 0.10/3	≤ 0.05/22 ≤ 0.10/5 ≤ 0.15/2
	sample No. 3	-	≤ 0.05/5	≤ 0.05/9	≤ 0.05/14	≤ 0.05/17 ≤ 0.10/3	≤ 0.05/21 ≤ 0.10/6 ≤ 0.15/2
weft	sample No. 1	-	≤ 0.05/1	≤ 0.05/5	≤ 0.05/13	≤ 0.05/919 ≤ 0.10/1	≤ 0.05/20 ≤ 0.10/7 ≤ 0.15/3
	sample No. 2	-	≤ 0.05/2	≤ 0.05/9	≤ 0.05/16	≤ 0.05/19 ≤ 0.10/4	≤ 0.05/24 ≤ 0.10/5 ≤ 0.15/2
	sample No. 3	-	≤ 0.05/1	≤ 0.05/10	≤ 0.05/14	≤ 0.05/19 ≤ 0.10/4	≤ 0.05/23 ≤ 0.10/8 ≤ 0.15/3

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

Table No. 11

	characteristic crack width W_{rk} [mm] at render strain value of 0.8%	
	warp	**weft**
AKE 145A	0.050	0.050
TG 22	0.050	0.050

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 m^2K/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:

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

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

$$U = 1/[R_{ETICS} + R_{SUBSTRATE} + R_{SE} + R_{SI}]$$

$R_{SUBSTRATE}$ 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 = χ_p * 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. 12

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 he 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) The 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 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 Institute for Construction Prague without delay.

Issued in Prague on 21/11/2018

by

Ing. Mária Schaan

Head of the Technical Assessment Body (TAB)

Annexes:

Annex No. 1 Insulation product characteristics for bonded ETICS with additional mechanical fixing – MW lamella (TR80)

Annex No. 2 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board (TR15)

Annex No. 3 Anchors, description of individual product characteristics contained in the ETA

Annex No. 4 Description of glass fibre mesh

Annex No. 5 Alternative trade names of the components

Annex No. 1 Insulation product characteristics for bonded ETICS with additional mechanical fixing – MW lamella (TR80)

Description and characteristics		Regulation	Declared characteristics MW lamella (TR80)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501	A1	Apparent density ≤ 165 kg/m³
Thermal resistance		Defined in CE mark in accordance with EN 13162		
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)		EN 12086 EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR80	≥ 80 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 40 kPa
Shear strength		EN 12090	---	≥ 20 kPa
Shear modulus of elasticity		EN 12090	---	≥ 1000 kPa

* - highest value applies

Note: Classes and levels for individual characteristics comply with EN 13162:2012+A1:2015 Only insulation products of the same or better declared characteristics, as stated in the table above, can be used in this ETICS.

Annex No. 2 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board (TR15)

Description and characteristics		Regulation	Declared characteristics MW board (TR15)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501	A1	Apparent density ≤ 165 kg/m³
Thermal resistance		Defined in CE mark in accordance with EN 13162		
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
Length		EN 822	---	± 2 %
Width			---	± 1.5 %
Squareness		EN 824	---	≤ 5 mm/m
Flatness		EN 825	---	≤ 6 mm
Surface		ETAG 004	No additional treatment (homogenous, without coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	≤ 1.0 kg/m²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m²
Diffusion factor (μ)		EN 12086 EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR15	≥ 15 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 6 kPa
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* - highest value applies

Note: Classes and levels for individual characteristics comply with EN 13162:2012+A1:2015 Only insulation products of the same or better declared characteristics, as stated in the table above, can be used in this ETICS.

Annex No. 3 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 NT U	60	See ETA-05/0009	0.60	2.43
EJOT SDM-T plus	60	See ETA-04/0064	0.70	2.24
ejotherm STR U, ejotherm STR U 2G	60	See ETA-04/0023	0.60	2.08
EJOT H1 eco	60	See ETA-11/0192	0.60	1.40
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
KOELNER TFIX-8M	60	See ETA-07/0336	1.00	1.75
KOELNER TFIX-8S a TFIX-8ST	60	See ETA-11/0144	0.60	2.04
WKTHERM ø 8	60	See ETA-11/0232	0.60	4.30
fischer TERMOZ 8SV	60	See ETA-06/0180	1.10	2.13
Fixplug 8	60	See ETA-15/0373	0.60	1.70
Fixplug 10	60		0.60	1.50
Plate anchor TTH 10/60-La	60	See ETA-09/0318	0.90	1.79

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
Countersunk assembly				
ejotherm STR U, ejotherm 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-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
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:	≥ 0.6 kN/mm
	Countersunk assembly:	≥ 0.7 kN/mm
Rupture force of anchor´s plate	≥ Higher of figures R_{panel} and R_{joint} in relevant table in Cl. **Chyba! Nenalezen zdroj odkazů.**	

Annex No. 4 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		

Annex No. 5 Alternative trade names of the components

	Adhesive - Trade name
	WEŁNOLEP K
trade name No. 2	MESTERPUDS K
	Base coat - Trade name
	WEŁNOLEP Z
trade name No. 2	MESTERPUDS Z
	Key coats - Trade name
	MAJSTERGRUNT PODTYNKOWY AKRYLOWY
trade name No. 2	MESTERGRUNDER AKRYL
	MAJSTERGRUNT PODTYNKOWY SILIKATOWY
trade name No. 2	MESTERGRUNDER SILIKAT
	MAJSTERGRUNT PODTYNKOWY SILIKONOWY
trade name No. 2	MESTERGRUNDER SILIKONE
	Finishing coats - Trade name
	MAJSTERTYNK SILIKATOWY
trade name No. 2	MESTERPUDS SILIKAT
	MAJSTERTYNK SILIKONOWY
trade name No. 2	MESTERPUDS SILIKONE
	MAJSTERTYNK MINERALNY
trade name No. 2	MESTERPUDS MINERAL
	MAJSTERTYNK Si-Si
trade name No. 2	MESTERPUDS SI-SI
	MAJSTERTYNK MOZAIKOWY
trade name No. 2	MESTERPUDS MOSAIK
	Protective paints - Trade name
	MAJSTERFARBA AKRYLOWA
trade name No. 2	MESTERMALING AKRYL
	MAJSTERFARBA SILIKATOWA
trade name No. 2	MESTERMALING SILIKAT
	MAJSTERFARBA SILIKONOWA
trade name No. 2	MESTERMALING SILIKONE

	Protective paints - Trade name
	MAJSTERFARBA Si-Si
trade name No. 2	MESTERMALING SI-SI