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European Technical Assessment

**ETA 16/0385
of 13/03/2017**

I General Part

Technical Assessment Body issuing the ETA:

Technical and Test Institute for Construction Prague

Trade name of the construction product: **LAKMA TERM MW**

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:

LAKMA SAT Sp. Z o o.
Frysztacka 173
43-400 Cieszyn, Poland

Manufacturing plant(s):

LAKMA SAT Sp. Z o o.
Mała Łąka 22
43-400 Cieszyn, Poland

LAKMA SAT Sp. Z o o.
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This European Technical Assessment contains:

39 pages including 10 Annexes which form an integral part of this assessment.

Annex No. 11 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, edition 2013, used as European Assessment Document (EAD)

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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 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 system 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 products with associated methods of fixing	Fully bonded ETICS with or without supplementary anchors (National application documents shall be taken into account).		
	<ul style="list-style-type: none"> • Insulation product according to EN 13162 See Annex No. 1 and 2 for insulation product characteristics for fully bonded ETICS with or without additional mechanical fixing – MW lamella (TR80 and TR100) 	/	50 to 400
	<ul style="list-style-type: none"> • Adhesives: <ul style="list-style-type: none"> - SYNTEKOL PSW (cement based powder requiring addition of water about 0.25 l/kg) - UNIWERSALNA ZAPRAWA KLEJACA (cement based powder requiring addition of water about 0.25 l/kg) - SYNTEKOL Q4 (cement based powder requiring addition of water about 0.25 l/kg) 	3.0 to 6.0 (dry)	3 - 20

	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. 9 for possible associations MW/anchors). National application documents shall be taken into account.		
	<ul style="list-style-type: none"> • Insulation product according to EN 13162 see Annex No. 3 to Annex No. 8 for product characteristics 	/	50 to 300
	<ul style="list-style-type: none"> • Supplementary adhesives: <ul style="list-style-type: none"> - SYNTEKOL PSW (cement based powder requiring addition of water about 0.25 l/kg) - UNIWERSALNA ZAPRAWA KLEJACA (cement based powder requiring addition of water about 0.25 l/kg) - SYNTEKOL Q4 (cement based powder requiring addition of water about 0.25 l/kg) 	3.0 to 6.0 (dry)	/
	<ul style="list-style-type: none"> • Anchors see Annex No. 9 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. 9. 		
	<ul style="list-style-type: none"> - Ejotherm STR U, STR U 2G plastic screwed-in anchors - EJOT SDM-T plus plastic screwed-in anchors - Ejot H1 eco plastic nailed-in anchors - BRAVOLL PTH-KZ 60/8-La plastic nailed-in anchors - BRAVOLL PTH-S 60/8-La plastic screwed-in anchors - BRAVOLL PTH-EX plastic nailed-in anchors - KEW TSD 8 plastic nailed-in anchors - KEW TSD-V plastic nailed-in anchors - KEW TSDL-V plastic nailed-in anchors - KOELNER TFIX-8M plastic nailed-in anchors - KOELNER KI-10M plastic nailed-in anchors - KOELNER KI-10N plastic nailed-in anchors - KOELNER KI-10NS plastic screw-in anchors 	ETA-04/0023 ETA-04/0064 ETA-11/0192 ETA-05/0055 ETA-08/0267 ETA-13/0951 ETA-04/0030 ETA 08/0315 ETA 12/0148 ETA-07/0336 ETA-07/0291 ETA-07/0221 ETA-07/0221	

	Components	Coverage (kg/m ²)	Thickness (mm)
	- KOELNER TFIX-8S, TFIX-8ST plastic screwed-in anchors	ETA-11/0144	
	- KOELNER TFIX-8P plastic nailed-in anchors	ETA-13/0845	
	- Hilti SX-FV plastic screwed-in anchors	ETA-03/0005	
	- Hilti XI-FV plastic gun-nailed anchors	ETA-03/0004	
	- Hilti D-FV, D-FV T plastic screwed-in anchors	ETA-05/0039	
	- Hilti HTS-P plastic screwed-in anchors	ETA-14/0400	
	- fischer TERMOZ 8 SV plastic screwed-in anchors	ETA-06/0180	
	- fischer TERMOFIX CF 8 plastic nailed-in anchors	ETA-07/0287	
	- fischer TERMOZ 8U plastic screwed-in anchors	ETA-02/0019	
	- fischer TERMOZ 8N, 8 NZ plastic nailed-in anchors	ETA-03/0019	
	- fischer TERMOZ CS 8 plastic screwed-in anchors	ETA-14/0372	
	- Wkret-met LMX 10 plastic nailed-in anchors	ETA-08/0172	
	- Wkret-met LMX 8 plastic nailed-in anchors	ETA-09/0001	
	- Wkret-met LFM 10 plastic nailed-in anchors	ETA-06/0105	
	- Wkret-met LFM 8 plastic nailed-in anchors	ETA-06/0080	
	- Wkret-met WKTHERM ø 8 plastic nailed-in anchors	ETA-11/0232	
	- Wkret-met eco drive plastic screw-in anchors	ETA-13/0107	
	- Wkret-met WKTHERM S plastic screw-in anchors	ETA-13/0724	
	- AMEX LDK plastic nailed-in anchors	ETA 09/0181	

	Components	Coverage (kg/m ²)	Thickness (mm)
Base coat	<ul style="list-style-type: none"> - SYNTEKOL PSW (cement based powder requiring addition of water about 0.25 l/kg) - UNIWERSALNA ZAPRAWA KLEJACA (cement based powder requiring addition of water about 0.25 l/kg) - SYNTEKOL Q4 (cement based powder requiring addition of water about 0.25 l/kg) 	3.0 to 6.0 (dry)	3 - 6
Reinforcement	<ul style="list-style-type: none"> • Standard mesh applied in single layer, see Annex No. 10 for product characteristics: - R 117 A101 - R 131 A101 - SSA-1363-145 - SSA-1363-160 - LIFITEX PRO 145 - LIFITEX PRO 165 - AKE 145 - AKE 170/160 - Asglatex 03-43 - Halico A 150 - OPTIMA NET 150 - OPTIMA NET 170 - LAKMA TERM A 150 - MASTERNET CLASSIC 145 	Mas per unit area < 0.4 kg//m ²	< 0.5
Key coat	<ul style="list-style-type: none"> - TOTALGRUNT (ready to used liquid) - TYNKSILGRUNT (ready to used liquid) - TYNKSILGRUNT Q (ready to used liquid) - AKRYL P (ready to used liquid) - PREPARAT GRUNTUJĄCY FRANCESCO GUARDI (ready to used liquid) 	0.20 – 0.35	/
Finishing coats	<ul style="list-style-type: none"> • cement based powder requiring addition of water – about 0.23 l/kg: - MINERALTYNK Q Z ribbed structure (max.particle size 1.5; 2.0; 2.5; 3.0 mm) - MINERALTYNK Q K floated structure (max.particle size 1.5; 2.0; 2.5; 3.0 mm) - POROLIT QM 	1.3 – 4.5 regulated by max. particle size	Regulated by particle size

Components	Coverage (kg/m ²)	Thickness (mm)
<p>machine applied (max.particle size 1.5; 2.0 mm)</p> <p>Mineral finishing coats can be used in combination with a decorative coat SILMAL ST, SILMAL SN, SILMAL SN REPAIR, AKRYL FASADA, FASMAL</p>		
<ul style="list-style-type: none"> • Ready to use paste – binder based on colloidal silica: <ul style="list-style-type: none"> - TYNKSIL S Z ribbed structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) - TYNKSIL S K floated structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) - POROLIT S machine applied (max. particle size 1.5; 2.0 mm) <p>Finishing coats based on colloidal silica can be used in combination with a decorative coat SILMAL ST, SILMAL SN, SILMAL SN REPAIR, AKRYL FASADA, FASMAL</p>	<p>1.2 – 3.8 regulated by max. particle size</p>	<p>Regulated by particle size</p>
<ul style="list-style-type: none"> • Ready to use paste –silicone binder: <ul style="list-style-type: none"> - TYNKSIL QS Z ribbed structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) - TYNKSIL QS K floated structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) - POROLIT QS machine applied (max. particle size 1.5; 2.0 mm) <p>Silicone finishing coats can be used in combination with a decorative coat SILMAL ST, SILMAL SN, SILMAL SN REPAIR, AKRYL FASADA, FASMAL</p>	<p>1.2 – 3.8 regulated by max. particle size</p>	<p>Regulated by particle size</p>
<ul style="list-style-type: none"> • Ready to use paste – silicate binder: <ul style="list-style-type: none"> - TYNKSIL Z ribbed structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) - TYNKSIL K floated structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) <p>Silicate finishing coats can be used in combination with a decorative coat SILMAL ST, SILMAL SN, SILMAL SN REPAIR, AKRYL FASADA, FASMAL</p>	<p>2.0 – 3.8 regulated by max. particle size</p>	<p>Regulated by particle size</p>
<ul style="list-style-type: none"> • Ready to use paste – acrylic binder: <ul style="list-style-type: none"> - AKRYLTYNK Z ribbed structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) 	<p>1.2 – 3.8 regulated by max. particle size</p>	<p>Regulated by particle size</p>

	Components	Coverage (kg/m ²)	Thickness (mm)
	<ul style="list-style-type: none"> - AKRYLTYNK K floated structure (max. particle size 1.5; 2.0; 2.5; 3.0 mm) POROLIT Z machine applied (max. particle size 1.5; 2.0 mm) <p>Acrylic finishing coats can be used in combination with a decorative coat SILMAL ST, SILMAL SN, SILMAL SN REPAIR, AKRYL FASADA, FASMAL</p>		
	<ul style="list-style-type: none"> • Mosaic finishing coats, ready to use paste – acrylic binder: <ul style="list-style-type: none"> - AKRYLTYNK M ribbed structure (max. particle size 1.6 mm) - TYNK KWARCOWY ribbed structure manually and machine applied (max. particle size 1.6 mm) - TYNK MARMUROWY ribbed structure manually and machine applied (max. particle size 1.6 mm) <p>Mosaic finishing coats can be used in combination with decorative coat IMPREGNAT DO TYNKÓW MOZAIKOWYCH</p>	1.8 – 6.0	Regulated by particle size
Decorative coats	<p>SILMAL SN ready to use liquid based on silicone binder</p> <p>SILMAL SN REPAIR ready to use liquid based on silicone binder</p> <p>AKRYL FASADE ready to use liquid based on acrylic binder</p> <p>SILMAL ST ready to use liquid based on silicate binder</p> <p>FASMAL ready to use liquid based on acrylic binder</p> <p>TYNKSIL QS Z Repair ready to used paste based on silicone binder, max. particle size 0.5 mm</p> <p>AKRYLTYNK Z Renowacyjny ready to used paste based on acrylic binder, max. particle size 0.5 mm</p> <p>IMPREGNAT DO TYNKÓW MOZAIKOWYCH ready to use liquid based on acrylic binder</p>		
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 - 8.

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 0.36 MJ/kg	No flame retardant	A2 – s1, d0
Panels of mineral wool (MW) Maximal density of 160 kg/m ³	In quantity ensuring Euroclass A1 according to 13501-1	-	
Base coat	- / max 0.36 MJ/kg	No flame retardant	
Glass fibre mesh	- / max 8.17 MJ/kg	No flame retardant	
Key coat	- / max. 5.82 MJ/kg	No flame retardant	
Finishing coats including decorative coats for mineral finishing coating	- / max 2.51 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 **SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4:**

Water absorption after 1 hour < 1 kg/m²

Water absorption after 24 hours < 0.5 kg/m²

- Rendering system:

Table No. 3

		Water absorption after 24 hours	
		< 0.5 kg/m ²	≥ 0.5 kg/m ²
Rendering system: base coat SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4 + finishing coats as indicated here:	MINERALTYNK Q Z MINERALTYNK Q K	X	
	POROLIT QM	X	
	TYNKSIL S Z TYNKSIL S K	X	
	POROLIT S	X	
	TYNKSIL QS Z TYNKSIL QS K	X	
	POROLIT QS	X	
	TYNKSIL Z TYNKSIL K	X	
	AKRYLTYNK Z AKRYLTYNK K	X	
	POROLIT Z	X	
	AKRYLTYNK M	X	
	TYNK KWARCOWY	X	
	TYNK MARMUROWY	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.

3.2.3 Impact resistance (ETAG 004 - clause 5.1.3.3)

Table No. 4

Render coating: base coat SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4 + reinforcement and finishing coats listed hereafter:	Single standard mesh
MINERALTYNK Q Z MINERALTYNK Q K	Category I
POROLIT QM	Category I
TYNKSIL S Z TYNKSIL S K	Category I
POROLIT S	Category I
TYNKSIL QS Z TYNKSIL QS K	Category I
POROLIT QS	Category I
TYNKSIL Z TYNKSIL K	Category I
AKRYLTYNK Z AKRYLTYNK K	Category I
POROLIT Z	Category I
AKRYLTYNK M	Category I
TYNK KWARCOWY	Category I
TYNK MARMUROWY	Category I

3.2.4 Water vapour permeability (ETAG 004 - clause 5.1.3.4)

Table No. 5

Rendering system: base coat SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4 + reinforcement and finishing coats indicated hereafter	Equivalent air layer thickness s_d
	Single standard mesh
MINERALTYNK Q Z MINERALTYNK Q K	≤ 0.26 m
POROLIT QM	≤ 0.26 m
TYNKSIL S Z TYNKSIL S K	≤ 0.32 m
POROLIT S	≤ 0.32 m
TYNKSIL QS Z TYNKSIL QS K	≤ 0.45 m
POROLIT QS	≤ 0.45 m
TYNKSIL QS Z + SILMAL SN	≤ 0.45 m
TYNKSIL QS K + SILMAL SN	≤ 0.45 m
POROLIT QS + SILMAL SN	≤ 0.45 m
TYNKSIL QS Z + SILMAL ST	≤ 0.53 m
TYNKSIL QS K + SILMAL ST	≤ 0.53 m
POROLIT QS + SILMAL ST	≤ 0.53 m
TYNKSIL QS Z + FASMAL	≤ 0.53 m
TYNKSIL QS K + FASMAL	≤ 0.53 m
POROLIT QS + FASMAL	≤ 0.53 m
TYNKSIL Z TYNKSIL K	≤ 0.46 m
TYNKSIL Z + SILMAL SN	≤ 0.50 m
TYNKSIL K + SILMAL SN	≤ 0.50 m
TYNKSIL Z + SILMAL ST	≤ 0.46 m
TYNKSIL K + SILMAL ST	≤ 0.46 m
TYNKSIL Z + FASMAL	≤ 0.67 m
TYNKSIL K + FASMAL	≤ 0.67 m
AKRYLTYNK Z AKRYLTYNK K	≤ 0.46 m

POROLIT Z	≤ 0.46 m
AKRYLTYNK Z + SILMAL SN	≤ 0.46 m
AKRYLTYNK K + SILMAL SN	≤ 0.46 m
POROLIT Z + SILMAL SN	≤ 0.46 m
AKRYLTYNK Z + SILMAL ST	≤ 0.46 m
AKRYLTYNK K + SILMAL ST	≤ 0.46 m
POROLIT Z + SILMAL ST	≤ 0.46 m
AKRYLTYNK Z + FASMAL	≤ 0.46 m
AKRYLTYNK K + FASMAL	≤ 0.46 m
POROLIT Z + FASMAL	≤ 0.46 m
AKRYLTYNK M	≤ 0.44 m
TYNK KWARCOWY	≤ 0.44 m
TYNK MARMUROWY	≤ 0.44 m
AKRYLTYNK M + IMPREGNANT DO TYNKOW ŻYWICNYCH	≤ 0.44 m
TYNK MARMUROWY + IMPREGNANT DO TYNKOW ŻYWICNYCH	≤ 0.44 m
TYNK KWARCOWY + IMPREGNANT DO TYNKOW ŻYWICNYCH	≤ 0.44 m

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

The kit was not assessed according EOTA TR 34.

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 **SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4:**

- Initial state: bond strength ≥ 0.012 MPa but a cohesive failure in the insulation product
- After hygrothermal cycles: bond strength ≥ 0.004 MPa but a cohesive failure in the insulation product
- After freeze-thaw cycles: test not required (see Cl. 3.2.2.2 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. 6

		Initial state	48 hours immersion in water + 2 hours. 23°C/50% RH	48 hours immersion in water + 7 days 23°C/50% RH
SYNTEKOL PSW / UNIWERSALNA ZAPRAWA KLEJACA / SYNTEKOL Q4	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 MPa
	MW board	< 0.08 MPa Failure in thermal insulation product	< 0.03 MPa Failure in thermal insulation product	< 0.08 MPa Failure in thermal insulation product

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

Base Coat **SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4:**

- After ageing: bond strength ≥ 0.017 MPa but a cohesive failure in the insulation product
- After freeze-thaw cycles After freeze-thaw cycles: test not required (see Cl. 3.2.2.2 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)

- Insulation product - MW board (TR15)

Table No. 7

Anchor description	Trade name		See Annex No. 9	
	Assembly		Surface assembly	Countersunk assembly (only monodensity products)
	Plate diameter (mm)		60 or more	
MW board characteristics (TR15)	Thickness (mm)		≥ 50	≥ 100
	Tensile strength (kPa)		≥ 15	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry condition	min. value: 0.44 kN average value: 0.49 kN	
		R_{panel} in wet condition	min. value: 0.32 kN average value: 0.34 kN	
	Anchors placed at joints of the insulation product	R_{joint} in dry condition	min. value: 0.41 kN average value: 0.42 kN	
		R_{joint} in wet condition	min. value: 0.24 kN average value: 0.26 kN	

- **Insulation product - MW board (TR10, monodensity)**

Table No. 8

Anchor description	Trade name		See Annex No. 9			
			plate stiffness ≥ 0.3		plate stiffness ≥ 0.5	
	Assembly method		Surface	Countersunk	Surface	Countersunk
	Plate diameter (mm)		60 or more			
MW board characteristics (TR10, monodensity)	Thickness (mm)		≥ 60	≥ 100	≥ 50	≥ 100
	Tensile strength (kPa)		≥ 10			
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.37 kN mean value: 0.39 kN		min. value: 0.48 kN mean value: 0.55 kN	
		R_{panel} in wet conditions	min. value: 0.19 kN mean value: 0.22 kN		No performance assessed	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.27 kN mean value: 0.32 kN		min. value: 0.39 kN mean value: 0.43 kN	
		R_{joint} in wet conditions	min. value: 0.18 kN mean value: 0.19 kN		No performance assessed	

- **Insulation product - MW board (TR10, dual density)**

Table No. 9

Anchor description	Trade name		Anchors BRAVOLL PTH 60/8 with plate IT PTH 100	Anchors BRAVOLL PTH 60/8 with plate IT PTH 140	Koelner TFIX-8 S with plate Koelner KWL 090
	Assembly		Surface	Surface	Surface
	Plate diameter (mm)		100	140	90
MW board (TR10, dual density)	Thickness (mm)		≥ 100	≥ 100	≥ 80
	Tensile strength (kPa)		≥ 10		
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry condition	min. value: 0.61 kN average value: 0.69 kN	min. value: 0.80 kN average value: 0.83 kN	min. value: 0.54 kN average value: 0.56 kN
		R_{panel} in wet condition	No performance assessed	No performance assessed	No performance assessed
	Anchors placed at joints of the insulation product	R_{joint} in dry condition	min. value: 0.44 kN average value: 0.57 kN	min. value: 0.56 kN average value: 0.62 kN	min. value: 0.47 kN average value: 0.49 kN
		R_{joint} in wet condition	No performance assessed	No performance assessed	No performance assessed

Table No. 10

Anchor description	Trade name		Anchors ejothem STR U 2G with additional plate VT 90 + 2G	Anchors BRAVOLL PTH-60/8 with additional plate ZT 100	Anchors Wkret-met eco-drive W	Anchors fischer termoz SV II ecotwist
	Assembly		Countersunk			Special
	Plate diameter (mm)		112.5	100	110	60
characteristics MW board (TR10, dual density)	Thickness (mm)		≥ 100			
	Tensile strength (kPa)		≥ 10			
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry condition	min. value: 0.78 kN average value: 0.91 kN	min. value: 0.63 kN average value: 0.72 kN	min. value: 0.63 kN average value: 0.65 kN	min. value: 0.38 kN average value: 0.40 kN
		R_{panel} in wet condition	No performance assessed			
Maximal load	Anchors placed at joints of the insulation product	R_{joint} in dry condition	min. value: 0.60 kN average value: 0.70 kN	min. value: 0.58 kN average value: 0.65 kN	min. value: 0.47 kN average value: 0.51 kN	min. value: 0.39 kN average value: 0.42 kN
		R_{joint} in wet condition	No performance assessed			

Table No. 11

Anchor description	Trade name		See Annex No. 9	
			plate stiffness ≥ 0.3	plate stiffness ≥ 0.6
	Assembly method		Surface assembly	
Plate diameter (mm)		60 or more		
MW board characteristics (TR10, dual density)	Thickness (mm)		≥ 80	≥ 100
	Tensile strength (kPa)		≥ 10	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.38 kN mean value: 0.41 kN	min. value: 0.42 kN mean value: 0.48 kN
		R_{panel} in wet conditions	No performance assessed	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.32 kN mean value: 0.37 kN	min. value: 0.34 kN mean value: 0.37 kN
		R_{joint} in wet conditions	No performance assessed	

Table No. 12

Anchor description	Trade name		Anchors BRAVOLL PTH KZ/S with plate IT PTH 100	Anchors BRAVOLL PTH KZ/S with plate IT PTH 140
	Assembly		Surface	Surface
	Plate diameter (mm)		100	140
MW board (TR10, dual density)	Thickness (mm)		≥ 100	≥ 100
	Tensile strength (kPa)		≥ 10	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry condition	min. value: 0.67 kN average value: 0.69 kN	min. value: 0.78 kN average value: 0.84 kN
		R_{panel} in wet condition	No performance assessed	
	Anchors placed at joints of the insulation product	R_{joint} in dry condition	min. value: 0.45 kN average value: 0.54 kN	min. value: 0.60 kN average value: 0.71 kN
		R_{joint} in wet condition	No performance assessed	

Table No. 13

Anchor description	Trade name		BRAVOLL PTH- S + BRAVOLL ZT 100	BRAVOLL PTH-S + BRAVOLL ZP	Klimas Wkret-met screw-in plug eco-drive W
	Assembly		Countersunk		
	Plate diameter (mm)		100	65	110
MW board characteristics (TR10, monodensity)	Thickness (mm)		≥ 100		
	Tensile strength (kPa)		≥ 10		
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry condition	min. value: 0.68 kN average value: 0.73 kN	min. value: 0.29 kN average value: 0.32 kN	min. value: 1.29 kN average value: 1.34 kN
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in wet condition	No performance assessed		
	Anchors placed at joints of the insulation product	R_{joint} in dry condition	min. value: 0.57 kN average value: 0.64 kN	min. value: 0.31 kN average value: 0.36 kN	min. value: 0.83 kN average value: 0.96 kN
		R_{joint} in wet condition	No performance assessed		

3.3.6 Render strip tensile test

- Base coat **SYNTEKOL PSW/ UNIWERSALNA ZAPRAWA KLEJACA/ SYNTEKOL Q4**

No performance assessed for glass fibre meshes **R 131 A101, SSA-1363-145, SSA-1363-160, LIFITEX PRO 145, LIFITEX PRO 165, AKE 145, AKE 170/160, Asglatex 03-43, Halico A 150, OPTIMA-NET 150, OPTIMA-NET 170, LAKMA TERM A 150, MASTERNET CLASSIC 145.**

Table No. 14

		Glass fibre mesh 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		$\varepsilon = 0.3 \%$	$\varepsilon = 0.5 \%$	$\varepsilon = 0.8 \%$	$\varepsilon = 1.0 \%$	$\varepsilon = 1.5 \%$	$\varepsilon = 2.0 \%$
Warp	Sample No. 1	$\leq 0.05/10$	$\leq 0.05/17$	$\leq 0.05/32$ $\leq 0.10/1$	$\leq 0.05/52$ $\leq 0.10/4$	$\leq 0.05/63$ $\leq 0.10/15$	$\leq 0.05/70$ $\leq 0.10/17$ $\leq 0.15/3$
	Sample No. 2	$\leq 0.05/8$	$\leq 0.05/19$	$\leq 0.05/32$ $\leq 0.10/1$	$\leq 0.05/43$ $\leq 0.10/1$	$\leq 0.05/69$ $\leq 0.10/12$ $\leq 0.15/1$	$\leq 0.05/67$ $\leq 0.10/27$ $\leq 0.15/3$
	Sample No. 3	$\leq 0.05/7$	$\leq 0.05/21$	$\leq 0.05/48$	$\leq 0.05/67$ $\leq 0.10/3$	$\leq 0.05/69$ $\leq 0.10/13$	$\leq 0.05/60$ $\leq 0.10/24$ $\leq 0.15/4$
Weft	Sample No. 1	$\leq 0.05/1$	$\leq 0.05/28$	$\leq 0.05/53$	$\leq 0.05/59$ $\leq 0.10/3$	$\leq 0.05/72$ $\leq 0.10/12$	$\leq 0.05/66$ $\leq 0.10/26$
	Sample No. 2	$\leq 0.05/5$	$\leq 0.05/25$	$\leq 0.05/49$	$\leq 0.05/65$ $\leq 0.10/7$	$\leq 0.05/76$ $\leq 0.10/15$	$\leq 0.05/63$ $\leq 0.10/36$
	Sample No. 3	$\leq 0.05/8$	$\leq 0.05/16$	$\leq 0.05/42$ $\leq 0.10/2$	$\leq 0.05/54$ $\leq 0.10/6$	$\leq 0.05/63$ $\leq 0.10/20$	$\leq 0.05/55$ $\leq 0.10/46$

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. 15

	Characteristic width of cracks W_{rk} [mm] at render strain value of 0.8%	
	Warp direction	Weft direction
R117 A101	0.072	0.069

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

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

Where:

- $\chi_p \times n$ has only to be taken into account if it is greater than 0.04 W/(m².K)
- U_c global (corrected) thermal transmittance of the covered wall (W/ (m².K)
- n number of anchors (through insulation product) per 1 m²
- χ_p local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:
- = 0.002 W/K for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw
($\chi_p \times n$ negligible for n < 20)
 - = 0.004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material
($\chi_p \times n$ negligible for n < 10)
 - = negligible for anchors with plastic nails (reinforced or not with glass fibres ...)

- U thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/ (m².K)) determined as follows:

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

Where:

- R_i thermal resistance of the insulation product (according to declaration in reference to EN 13162) in (m².K)/W
- R_{render} thermal resistance of the rendering system (about 0.02 in (m².K)/W) or determined by test according to EN 12667 or EN 12664
- $R_{substrate}$ thermal resistance of the substrate of the building (concrete, brick ...) in (m².K)/W
- R_{se} external superficial thermal resistance in (m².K)/W

R_{si} internal superficial thermal resistance in (m².K)/W

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

3.6 Sustainable use of natural resources (BWR 7)

No performance assessed.

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

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

Table No. 16

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 13/03/2017

by



Ing. Mária Schaan

Head of the Technical Assessment Body



Annex No. 1 Insulation product characteristics for fully bonded ETICS with or without additional mechanical fixing – MW lamella (TR100)

Description and characteristics		Regulation	Declared characteristics MW lamella (TR100) (fibre orientation perpendicular)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1 or A2	Apparent density $\leq 160 \text{ kg/m}^3$
Thermal resistance		EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 mm
			T4	-3 % or -3 mm*, +5 % or +5 mm**,
Length		EN 822	---	$\pm 2 \%$
Width			---	$\pm 1.5 \%$
Squareness		EN 824	---	$\leq 5 \text{ mm/m}$
Flatness		EN 825	---	$\leq 6 \text{ mm}$
Surface		ETAG 004	No additional treatment (homogenous, with coating)	
Dimensional stability under defined temperature and humidity		EN 1604	DS(70,90)	1 %
Water absorption	Short term water absorption	EN 1609	WS	$\leq 1.0 \text{ kg/m}^2$
	Long term water absorption	EN 12087	WL(P)	$\leq 3.0 \text{ kg/m}^2$
Diffusion factor (μ)(-)		EN 12086 - EN 13162	MU1	1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR100	$\geq 100 \text{ kPa}$
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	$\geq 50 \text{ kPa}$
Shear strength		EN 12090	---	$\geq 20 \text{ kPa}$
Shear modulus of elasticity		EN 12090	---	$\geq 1000 \text{ kPa}$

* higher value applies

** lower value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 2 Insulation product characteristics for fully bonded ETICS with or without additional mechanical fixing – MW lamella (TR80)

Description and characteristics	Regulation	Declared characteristics MW lamella (TR80) (fibre orientation perpendicular)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501-1 +A1:2009	A1 or A2	Apparent density $\leq 160 \text{ kg/m}^3$	
Thermal resistance	EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162		
Thickness	EN 823	T5	-1 % or -1 mm*, +3 mm	
		T4	-3 % or -3 mm*, +5 % or +5 mm**,	
Length	EN 822	---	$\pm 2 \%$	
Width		---	$\pm 1.5 \%$	
Squareness	EN 824	---	$\leq 5 \text{ mm/m}$	
Flatness	EN 825	---	$\leq 6 \text{ mm}$	
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	$\leq 1.0 \text{ kg/m}^2$
	Long term water absorption	EN 12087	WL(P)	$\leq 3.0 \text{ kg/m}^2$
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR80	$\geq 80 \text{ kPa}$	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	$\geq 50 \text{ kPa}$	
Shear strength	EN 12090	---	$\geq 20 \text{ kPa}$	
Shear modulus of elasticity	EN 12090	---	$\geq 1000 \text{ kPa}$	

* higher value applies

** lower value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 3 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW board (TR15)

Description and characteristics	Regulation	Declared characteristics MW board (TR15) (longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1 or A2	Apparent density ≤ 155 kg/m ³	
Thermal resistance	EN 12667 EN 12939	Defined in CE mark in accordance with EN 13162		
Thickness	EN 823	T5	-1 % or -1 mm*, +3 mm	
		T4	-3 % or -3 mm*, +5 % or +5 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
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	---	---	

* higher value applies

** lower value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 4 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW board RockSATE MD (TR10)

Description and characteristics	Regulation	Declared characteristics MW board RockSATE MD (TR10) (longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m ³	
Thermal resistance	EN 12667 EN 12939	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 or with 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR10	≥ 10 kPa	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 4 kPa	
Shear strength	EN 12090	---	---	
Shear modulus of elasticity	EN 12090	---	---	

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 5 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW board Panneau 431 (TR10)

Description and characteristics	Regulation	Declared characteristics MW board Panneau 431 (TR10) (longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m ³	
Thermal resistance	EN 12667 EN 12939	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 or with 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR10	≥ 10 kPa	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 4 kPa	
Shear strength	EN 12090	---	---	
Shear modulus of elasticity	EN 12090	---	---	

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 6 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW boards ECOROCK MONO / RockSATE MD Plus (TR10)

Description and characteristics	Regulation	Declared characteristics MW boards ECOROCK MONO / RockSATE MD Plus (TR10) (longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 120 kg/m ³	
Thermal resistance	EN 12667 EN 12939	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 or with 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR10	≥ 10 kPa	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 4 kPa	
Shear strength	EN 12090	---	---	
Shear modulus of elasticity	EN 12090	---	---	

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 7 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW board Frontrock Max E (TR10)

Description and characteristics	Regulation	Declared characteristics MW board Frontrock Max E (TR10) (dual density board, longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m ³	
Thermal resistance	EN 12667 EN 12939	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 or with 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR10	≥ 10 kPa	
		TR7.5**	≥ 7.5 kPa**	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 4 kPa	
			≥ 3 kPa**	
Shear strength	EN 12090	---	---	
Shear modulus of elasticity	EN 12090	---	---	

* higher value applies

** valid only if insulation product's thickness is 60 mm

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 8 Insulation product characteristics for mechanically fixed ETICS with anchors and supplementary bonding – MW board External Wall DD Panel (TR10)

Description and characteristics	Regulation	Declared characteristics MW board External Wall DD Panel (TR10) (dual density board, longitudinal fibre orientation)		
		Class, level according to EN 13162	Value	
Reaction to fire	EN 13501 -1+A1:2009	A1	Apparent density ≤ 155 kg/m ³	
Thermal resistance	EN 12667 EN 12939	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 or with 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/m ²
	Long term water absorption	EN 12087	WL(P)	≤ 3.0 kg/m ²
Diffusion factor (μ)(-)	EN 12086 - EN 13162	MU1	1	
Tensile strength perpendicular to the faces of insulation product in dry conditions	EN 1607	TR10	≥ 10 kPa	
Tensile strength perpendicular to the faces of insulation product in wet conditions	ETAG 004	---	≥ 4 kPa	
Shear strength	EN 12090	---	---	
Shear modulus of elasticity	EN 12090	---	---	

* higher value applies

Note: Classes and levels for individual characteristics comply with EN 13162+A1:2015

Annex No. 9 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 STR U, STR U 2G	60	see ETA - 04/0023	0.60	2.08
EJOT SDM-T plus	60	see ETA - 04/0064	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-S 60/8-La	60	see ETA - 08/0267	0.90	2.60
BRAVOLL PTH-EX	60	see ETA - 13/0951	0.60	1.40
KEW TSD 8	60	see ETA - 04/0030	0.53	1.63
KEW TSD-V	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
Koelner KI-10M	60	see ETA - 07/0291	0.45	0.85
Koelner KI-10N, KI-10NS	60	see ETA - 07/0221	0.50	1.23
KOELNER TFIX-8S	60	See ETA - 11/0144	0.60	2.04
KOELNER TFIX-8P	60	See ETA - 13/0845	0.30	1.38
Hilti HTS-P	60	See ETA - 14/0400	0.60	1.60
Hilti SX-FV	60	See ETA - 03/0005	0.70	1.73
Hilti-Dämmstoff-Befestigungselement XI-FV	60	See ETA - 03/0004	0.40	1.60
Hilti WDVS-Schraubdübel D-FV. D-FV T	60	See ETA - 05/0039	0.80	1.93
fischer Schlagdübel TERMOFIX CF 8	60	See ETA - 07/0287	0.50	1.65
fischer TERMOZ 8U	60	See ETA - 02/0019	0.50	2.45
fischer Schlagdübel TERMOZ 8N	60	See ETA - 03/0019	0.50	1.34
fischer Schlagdübel TERMOZ 8 NZ	60	See ETA - 03/0019	0.50	1.43
fischer TERMOZ CS 8	60	See ETA - 14/0372	0.60	1.70
Wkret-met LMX ø 10	60	see ETA - 08/0172	0.50	1.64

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
Wkret-met LMX ø 8	60	see ETA - 09/0001	0.50	1.53
Wkret-met LFM ø 10	60	see ETA – 06/0105	0.5	2.4
Wkret-met LFM ø 8	60	see ETA – 06/0080	0.5	1.26
Wkret-met WK THERM ø 8	60	see ETA - 11/0232	0.60	4.3
Wkret-met WK THERM S	60	see ETA - 13/0724	0.60	4.3
AMEX LDK	60	see ETA - 09/0182	0,40	0,53
Countersunk assembly				
Ejothem STR U, STR U 2G	60	see ETA - 04/0023	0.60	2.08
BRAVOLL PTH-S 60/8-La	60	see ETA - 08/0267	0.90	2.60
KOELNER TFIX-8ST	60	see ETA - 11/0144	0.60	2.04
fischer TERMOZ 8 SV	60	see ETA - 06/0180	1.10	2.13
Wkret-met eco drive	60 (110)	see ETA – 13/0107	0.60	2.80
Slip-on plates				
BRAVOLL IT PTH	100, 140	see ETA - 06/0267		
EJOT VT, VT 2G	90	see ETA – 04/0023		
EJOT SBL 140 plus	140	see ETA – 04/0023		
KEW DSB	90, 100, 140	see ETA – 04/0030		
Koelner KWL	90, 100, 140	see ETA – 07/0221		
Fischer DT	90, 100, 140	see ETA – 02/0019		
Kret-met TDX, TDX-P	90, 140	see ETA – 05/0225		
AMEX TK	140	see ETA – 09/0182		
Hilti HDT-FV-9	90	see ETA – 14/0400		

In addition to this list, anchors assessed in accordance with ETAG 014 can be used provided that such anchors meet the following requirements:

	Requirements	
Plate diameter	≥ 60 mm	
Plate stiffness	Surface assembly:	≥ 0.3 kN/mm
	Countersunk assembly:	≥ 0.6 kN/mm
Rupture force of anchor's plate	≥ Higher of figures R_{panel} and R_{joint} in relevant table in Cl. 3.3.5	
Nail of anchor	Made out of metal	

Annex No. 10 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 (%)
R117 A101	4,5 x 4,0 mm	≥ 20	≥ 50
R 131 A101	3,8 x 3,8 mm		
SSA-1363-145	4 x 5,5 mm		
SSA-1363-160	4 x 5 mm		
LIFITEX PRO 145	4 x 5,5 mm		
LIFITEX PRO 165	4 x 4 mm		
AKE 145	4,0 x 4,5 mm		
AKE 170/160	3,8 x 3,8 mm		
Halico A 150	4,7 x 4,5 m		
OPTIMA-NET 150	4,0 x 4,5 mm		
OPTIMA-NET 150	3,6 x 4,0 mm		
MASTERNET CLASSIC 145	5,0 x 5,0 mm		
LAKMA TERM A 150	4,7 x 4,5 mm		