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European Technical Assessment

ETA 15/0575
of 29/03/2017

I General Part

Technical Assessment Body issuing the ETA:

Technical and Test Institute for Construction Prague

Trade name of the construction product

**TURBO-W, TURBO-WSA, TURBO-WSO,
TURBO-WSO PROTECT, TURBO-WSISI,
TURBO-W MAX PROTECT, TURBO-W
ECO PROTECT**

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)

KREISEL – Technika Budowlana Sp z o.o.

ul. Sz. Szeregów 23, 60-462 Poznań

Republic of Poland

www.kreisel.pl

Manufacturer

Ul. Sz. Szeregów 23, 60-462 Poznań

Ul. Bory, 42-504 Bedzin

Ul. 11 listopada 29, 97-225 Ujazd

Kaliska 141,87-840 Lubień Kujawski

Republic of Poland

Manufacturing plant(s)

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

This European Technical Assessment contains

Annex No. 11 Control Plan contains
confidential information and is not included in
the European Technical Assessment when that
assessment is publicly disseminated.

ETAG 004, edition 2013, used as European
Assessment Document (EAD)

This European Technical Assessment is issued in accordance with regulation (EU) No. 305/2011 on the basis of

This European Technical Assessment replaces:

ETA 15/0575 valid from 26/01/2017

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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 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, 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/m ²)	Thickness (mm)
Insulation materials with associated methods of fixing	Fully bonded ETICS with supplementary anchors. National application documents shall be taken into account.		
	Insulation product: MW according to EN 13162 see Annex No. 1 Insulation product characteristics for bonded ETICS with additional mechanical fixing – MW lamella (TR80) for product characteristics	/	50 to 250
	- Adhesives: min. bonded surface: 100 % - LEPSTYR-W 230/LEPSTYR-W 230 EXTRA cement based powder requiring addition of water - 0.25 l/kg) - STYRLEP-W 240/STYRLEP-W 240 EXTRA cement based powder requiring addition of water – 0.25 l/kg) - STYRLEP-B 225 cement based powder requiring addition of water – 0.28 l/kg)	5.0 - 6.0 of dry matter	/

	Components	Coverage (kg/m ²)	Thickness (mm)
Insulation materials 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.		
	Insulation product: MW according to EN 13162 see Annex No. 2 to 8 for product characteristics	/	50 to 300
	- Supplementary adhesives: min. bonded surface: 30 % - LEPSTYR-W 230/LEPSTYR-W 230 EXTRA cement based powder requiring addition of water - 0.25 l/kg) - STYRLEP-W 240/STYRLEP-W 240 EXTRA cement based powder requiring addition of water – 0.25 l/kg) - STYRLEP-B 225 cement based powder requiring addition of water – 0.28 l/kg)	3.0 to 4.0 of dry matter	/
	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.		
	- Ejotherm NT U plastic nailed-in anchors - Ejotherm STR U, STR U 2G plastic screw-in anchors - Ejotherm NTK U plastic nailed-in anchors - EJOT H1 eco, EJOT H4 eco plastic nailed-in anchors - EJOT H3 plastic nailed-in anchors - KOELNER KI-10, KI-10PA, KI-10M plastic nailed-in anchors - KOELNER KI-10N, KI-10NS plastic nailed-in anchors - KOELNER TFIX-8M plastic nailed-in anchors - KOELNER TFIX-8S a TFIX-8ST plastic screw-in anchors - KOELNER TFIX-8P plastic nailed-in anchors	ETA-05/0009 ETA-04/0023 ETA-07/0026 ETA-11/0192 ETA-14/0130 ETA-07/0291 ETA 07/0221 ETA-07/0336 ETA-11/0144 ETA-13/0845	

	Components	Coverage (kg/m ²)	Thickness (mm)
Insulation materials with associated methods of fixing	- WKRET-MET LFN ø 10, LFM ø 10 plastic nailed-in anchors	ETA-06/0105	
	- WKRET - MET LFN ø 8, LFM ø 8 plastic nailed-in anchors	ETA-06/0080	
	- WKRET-MET LTX ø 10, LMX ø 10 plastic nailed-in anchors	ETA-08/0172	
	- WKRET-MET LTX ø 8, LMX ø 8 plastic nailed-in anchors	ETA-09/0001	
	- FIXPLUG ø 8, FIXPLUG ø 10 plastic nailed-in anchors	ETA-11/0231	
	- WK THERM ø 8 plastic screw-in anchors	ETA-11/0232	
	- Klimas Wkret-med screw-in plug eco-drive plastic screw-in anchors	ETA-13/0107	
	- WK THERM S plastic nailed-in anchors	ETA-13/0724	
	- KEW TSD 8 plastic nailed-in anchors	ETA-04/0030	
	- KEW TSBD 8 plastic screw-in anchors	ETA-08/0314	
	- KEW TSD-V plastic nailed-in anchors	ETA-08/0315	
	- KEW TSDL-V plastic nailed-in anchors	ETA-12/0148	
	- KEW TSD-V KN plastic nailed-in anchors	ETA-13/0075	
	- fischer TERMOZ 8U, 8UZ plastic screw-in anchors	ETA-02/0019	
	- fischer TERMOZ 8N, 8NZ plastic screw-in anchors	ETA-03/0019	
	- Hilti-Dämmstoff-Befestigungselement XI-FV plastic gun-nailed anchors	ETA-03/0004	
	- Hilti SX-FV plastic screw-in anchors	ETA-03/0005	
	- Hilti SD-FV8 plastic nailed-in anchors	ETA-03/0028	
	- Hilti WDV S-Schlagdübel SDK-FV 8 plastic nailed-in anchors	ETA-07/0302	
	- Hilti WDV S- Schraubdübel D-FV, D-FV T plastic screw-in anchors	ETA-05/0039	

	Components	Coverage (kg/m ²)	Thickness (mm)
Base coat	- STYRLEP-W 240/STYRLEP-W 240 EXTRA - cement based powder requiring addition of water 0.25 l/kg) - STYRLEP-B 225 - cement based powder requiring addition of water 0.28 l/kg	5.0 – 6.0 of dry matter for double reinforcement: 7.0 – 8.0 of dry matter	3 – 5 for double reinforcement: 5
Reinforcement	• Standard mesh applied in a single layer or in two layers see Annex No. 10 for product characteristics: - R 117 A101 / AKE 145 - R 131 A101 / AKE 160 - R 167 A101 - SSA-1363-4 SM	/	/
	• Reinforced mesh applied in a one layer see Annex No. 10 for product characteristics: - REDNET CB330 NOVA	/	/
Key coat	• Key coats shall always be used with STYRLEP-W 240/ STYRLEP-W 240 EXTRA • For STYRLEP-B 225 is use of the key coat voluntary. - TYNKOLIT-T 330 - to be used with mineral and acrylic binder finishing coats - pigmented ready to use liquid - TYNKOLIT-SA 331 - to be used with silicate binder finishing coats - pigmented ready to use liquid - TYNKOLIT-SO 332 - to be used with silicone binder finishing coats - pigmented ready to use liquid - TYNKOLIT-SISI 333 - to be used with silicate-silicone binder finishing coats - pigmented ready to use liquid - TYNKOLIT -U 340 - to be used with all finishing coats stated in this ETA - pigmented ready to use liquid	0.2 – 0.3	/

	Components	Coverage (kg/m ²)	Thickness (mm)
Finishing coats	- Cement based powder requiring addition of water 0.25 l/kg – mineral binder POZTYNK-SZ 062 Kornputz (particle size 1.0; 1.5; 2.0; 3.0 mm) POZTYNK-SZ 061 Kratzputz (particle size 1.5; 2.0; 2.5 mm)	2.1 – 4.3 Regulated by particle size 2.0 – 4.1 Regulated by particle size	1.0 – 3.0 Regulated by particle size
	- Ready to use paste - silicone binder: SILIKOTYNK 030 Kornputz (particle size 1.5; 2.0; 3.0 mm) SILIKOTYNK 030 Kratzputz (particle size 1.5; 2.0; 3.0 mm) SILIKON Protect 031 Kornputz (particle size 1.5; 2.0; 3.0 mm) SILIKON Protect 031 Kratzputz (particle size 1.5; 2.0; 3.0 mm)	2.4 – 5.0 Regulated by particle size 1.7 – 3.7 Regulated by particle size 2.4 – 5.0 Regulated by particle size 1.7 – 3.7 Regulated by particle size	1.5 – 3.0 Regulated by particle size
	- Ready to use paste - silicate binder: SILIKATYNK 020 Kornputz (particle size 0.5; 1.5; 2.0; 3.0 mm) SILIKATYNK 020 Kratzputz (particle size 1.5; 2.0; 3.0 mm)	0.9 – 5.0 Regulated by particle size 1.7 – 3.7 Regulated by particle size	0.5 – 3.0 Regulated by particle size
	- Ready to use paste – silicate and silicone binder: SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz (particle size 1.5; 2.0; 2.5 mm) SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz (particle size 1.5; 2.0; 2.5 mm) ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz (particle size 1.5; 2.0; 2.5 mm) ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz (particle size 1.5; 2.0; 2.5 mm)	2.4 – 5.0 Regulated by particle size 1.7 – 3.7 Regulated by particle size 2.4 – 5.0 Regulated by particle size 1.7 – 3.7 Regulated by particle size	1.5 – 3.0 Regulated by particle size

	Components	Coverage (kg/m ²)	Thickness (mm)
	Ready to use paste – silicone - polyurethane binder:		
	- MAX PROTECT 042 Kornputz (particle size 0.5; 1.0; 1.5; 2.0; 3.0 mm)	0.9 – 5.0 Regulated by particle size	0.5 – 3.0 Regulated by particle size
	- MAX PROTECT 042 Kratzputz (particle size 0.5; 1.0; 1.5; 2.0; 3.0 mm)	0.9 – 3.7 Regulated by particle size	
Protection coats for mineral finishing coats	One of the protection coats shall always be used with mineral binder finishing coats (POZTYNK SZ)		
	- FARBA SILIKATOWA 002 ready to use liquid - FARBA SILIKONOWA 003/ FARBA SILIKONOWA 003 California/ FARBA NANOTECH 006/ BIOFARBA 008 ready to use liquid - FARBA SISI 004 ready to use liquid - FARBA ECO 009 ready to use liquid - FARBA EGALIZACYJNA 005 ready to use liquid	0.15 – 0.25 l/m ² regulated by particle size	/
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. Changes to the ETICS or production process, which could result in this deposited data/information being incorrect, shall be notified to the Technical and Test Institute Prague before the changes are introduced. The Technical and Test Institute Prague will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

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 know to the concerned people.

2.5 Use, maintenance and repair

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 – 10.

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	Flame retardant content	Euroclass according to EN 13501-1
Adhesive	max 0.61 MJ/kg	No flame retardant	A2 – s1, d0
boards of mineral wool MW maximal density 150 kg/m ³	In quantity ensuring Euroclass A1 or A2 according to 13501-1	/	
Base coat render	max. 0.61 MJ/kg	No flame retardant	
Glass fibre mesh	max 8.48 MJ/kg	No flame retardant	
Finishing coats	max 2.27 MJ/kg	No flame retardant	
Protection coats for mineral finishing coats	max 5.34 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 **STYRLEP-W 240/STYRLEP-W 240 EXTRA**
STYRLEP-B 225

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 STYRLEP-W 240/ STYRLEP-W 240 EXTRA, STYRLEP-B 225 + finishing coats indicated hereafter with adequate key coat:	POZTYNK - SZ 062 Kornputz POZTYNK – SZ 061 Kratzputz	FARBA SILIKATOWA 002	X	
		FARBA SILIKONOWA 003/ FARBA SILIKONOWA 003 California/ FARBA NANOTECH 006/ BIOFARBA 008		
		FARBA SISI 004		
		FARBA ECO 009		
		FARBA EGALIZACYJNA 005		
	SILIKOTYNK 030 Kornputz		X	
	SILIKOTYNK 030 Kratzputz			
	SILIKON Protect 031 Kornputz		X	
	SILIKON Protect 031 Kratzputz			
	SILIKATYNK 020 Kornputz		X	
	SILIKATYNK 020 Kratzputz			
	SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz		X	
	ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz		X	
	MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz		X	

- Base coat **STYRLEP-B 225**
- Rendering system:

Table No. 4

			Water absorption after 24 hours	
			< 0.5 kg/m ²	≥ 0.5 kg/m ²
Rendering system: Base coat STYRLEP-B 225 + finishing coats indicated hereafter without key coat:	POZTYNK - SZ 062 Kornputz POZTYNK - SZ 061 Kratzputz	FARBA SILIKATOWA 002		X
		FARBA SILIKONOWA 003/ FARBA SILIKONOWA 003 California/ FARBA NANOTECH 006/ BIOFARBA 008	X	
		FARBA SISI 004		
		FARBA ECO 009		
		FARBA EGALIZACYJNA 005		X
		SILIKOTYNK 030 Kornputz SILIKOTYNK 030 Kratzputz	X	
		SILIKON Protect 031 Kornputz SILIKON Protect 031 Kratzputz	X	
		SILIKATYNK 020 Kornputz SILIKATYNK 020 Kratzputz		X
		SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz		X
		ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz	X	
		MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz	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

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.

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

Pass (without defects, satisfactory bond strength).

3.2.3 Impact resistance (ETAG 004 - clause 5.1.3.3)

Table No. 5

Rendering system: base coat STYRLEP 240/STYRLEP 240 EXTRA, STYRLEP-B 225 + reinforcement and finishing coats indicated hereafter:	Single standard mesh	Double standard mesh	Single reinforced mesh
POZTYNK - SZ 062 Kornputz + all kinds of protection coats POZTYNK - SZ 061 Kratzputz + all kinds of protection coats	Category III	Category I	Category I
SILIKOTYNK 030 Kornputz SILIKOTYNK 030 Kratzputz	Category II	Category I	Category I
SILIKON Protect 031 Kornputz SILIKON Protect 031 Kratzputz			
SILIKATYNK 020 Kornputz SILIKATYNK 020 Kratzputz	Category II	Category I	Category II
SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz	Category II	Category I	Category I
ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz	Category II	Category I	Category I
MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz	Category II	Category I	Category I

3.2.4 Water vapour permeability (ETAG 004 - clause 5.1.3.4)

Table No. 6

Rendering system: base coat STYRLEP-W 240/STYRLEP-W 240 EXTRA + finishing coats indicated hereafter with an adequate key coat	Equivalent air thickness s_d	
	Single mesh	Double mesh or Single reinforced mesh
POZTYNK - SZ 062 Kornputz + all kinds of protection coats POZTYNK - SZ 061 Kratzputz + all kinds of protection coats	$\leq 0.40 \text{ m}$	$\leq 0.40 \text{ m}$
SILIKOTYNK 030 Kornputz SILIKOTYNK 030 Kratzputz	$\leq 0.40 \text{ m}$	$\leq 0.41 \text{ m}$
SILIKON Protect 031 Kornputz SILIKON Protect 031 Kratzputz	$\leq 0.29 \text{ m}$	$\leq 0.31 \text{ m}$
SILIKATYNK 020 Kornputz SILIKATYNK 020 Kratzputz	$\leq 0.30 \text{ m}$	$\leq 0.30 \text{ m}$
SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz	$\leq 0.40 \text{ m}$	$\leq 0.40 \text{ m}$
ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz	$\leq 0.40 \text{ m}$	$\leq 0.40 \text{ m}$
MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz	$\leq 0.25 \text{ m}$	$\leq 0.38 \text{ m}$

Table No. 7

Rendering system: base coat STYRLEP-B 225 + finishing coats indicated hereafter with an adequate key coat	Equivalent air thickness s_d	
	Single mesh	Double mesh or Single reinforced mesh
POZTYNK - SZ 062 Kornputz + all kinds of protection coats POZTYNK - SZ 061 Kratzputz + all kinds of protection coats	≤ 0.27 m	≤ 0.27 m
SILIKOTYNK 030 Kornputz SILIKOTYNK 030 Kratzputz	≤ 0.38 m	≤ 0.46 m
SILIKON Protect 031 Kornputz SILIKON Protect 031 Kratzputz	≤ 0.23 m	≤ 0.27 m
SILIKATYNK 020 Kornputz SILIKATYNK 020 Kratzputz	≤ 0.27 m	≤ 0.29 m
SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz	≤ 0.35 m	≤ 0.38 m
ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz	≤ 0.35 m	≤ 0.38 m
MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz	≤ 0.41 m	≤ 0.42 m

Table No. 8

Rendering system: base coat STYRLEP-B 225 + finishing coats indicated hereafter without a key coat	Equivalent air thickness s_d	
	Single mesh	Double mesh or Single reinforced mesh
POZTYNK - SZ 062 Kornputz + all kinds of protection coats POZTYNK - SZ 061 Kratzputz + all kinds of protection coats	≤ 0.22 m	≤ 0.22 m
SILIKOTYNK 030 Kornputz SILIKOTYNK 030 Kratzputz	≤ 0.35 m	≤ 0.45 m
SILIKON Protect 031 Kornputz SILIKON Protect 031 Kratzputz	≤ 0.22 m	≤ 0.27 m
SILIKATYNK 020 Kornputz SILIKATYNK 020 Kratzputz	≤ 0.26 m	≤ 0.27 m
SISITYNK 040 Kornputz/ SISITYNK 040 California Kornputz SISITYNK 040 Kratzputz/ SISITYNK 040 California Kratzputz	≤ 0.27 m	≤ 0.29 m
ECO TYNK 022 ECO PROTECT Kornputz/ ECO TYNK 022 ECO PROTECT California Kornputz ECO TYNK 022 ECO PROTECT Kratzputz/ ECO TYNK 022 ECO PROTECT California Kratzputz	≤ 0.27 m	≤ 0.29 m
MAX PROTECT 042 Kornputz MAX PROTECT 042 Kratzputz	≤ 0.36 m	≤ 0.38 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)

- STYRLEP-W 240/STYRLEP-W 240 EXTRA
- STYRLEP-B 225
- Initial state: bond strength ≥ 0.005 MPa but cohesive failure in the insulation product
- After hygrothermal cycles: bond strength ≥ 0.003 MPa but cohesive failure in the insulation product
- After freeze-thaw cycles: bond strength ≥ 0.003 MPa but 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. 9

		Initial state	48 hours immersion in water + 2 hours. 23°C/50% RH	48 hours immersion in water + 7 days 23°C/50% RH
LEPSTYR-W 230/ LEPSTYR-W 230 EXTRA, STYRLEP-B 225, STYRLEP-W 240/ STYRLEP-W 240 EXTRA	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	MW lamella	≥ 0.08 MPa	≥ 0.03 MPa	< 0.08 MPa and cohesive failure in the insulation product

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

- After ageing: bond strength ≥ 0.003 MPa but cohesive failure in the insulation product
- After freeze-thaw cycles: ≥ 0.003 MPa but cohesive failure in 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)

- Insulation product MW board (TR15)

Table No. 10

Anchor description	Trade name		See Annex No. 9	
	Assembly method		Surface assembly	Countersunk assembly
	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 conditions	min. value: 0.45 kN mean value: 0.49 kN	min. value: 0.50 kN mean value: 0.52 kN
		R_{panel} in wet conditions	min. value: 0.37 kN mean value: 0.39 kN	min. value: 0.43 kN mean value: 0.45 kN
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.36 kN mean value: 0.38 kN	min. value: 0.43 kN mean value: 0.47 kN
		R_{joint} in wet conditions	min. value: 0.28 kN mean value: 0.31 kN	min. value: 0.33 kN mean value: 0.35 kN

- Insulation product MW double density panel Frontrock MAX E (TR10)

Table No. 11

Anchor description	Trade name		See Annex No. 9				
			Plate stiffness ≥ 0.6		Plate stiffness $\geq 0.5 < 0.6$		
	Assembly method		Surface assembly				
	Plate diameter (mm)		60 or more				
MW board characteristics Frontrock MAX E (TR10)	Thickness (mm)		≥ 80	≥ 100	≥ 80	≥ 100	
	Tensile strength (kPa)		≥ 10				
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.47 kN	min. value: 0.42 kN	min. value: 0.38 kN	min. value: 0.38 kN	
			mean value: 0.51 kN	mean value: 0.49 kN	mean value: 0.41 kN	mean value: 0.41 kN	
		R_{panel} in wet conditions	min. value: 0.26 kN	No performance assessed.			
			mean value: 0.29 kN				
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.34 kN	min. value: 0.40 kN	min. value: 0.32 kN	min. value: 0.28 kN	
			mean value: 0.39 kN	mean value: 0.43 kN	mean value: 0.37 kN	mean value: 0.32 kN	
	R_{joint} in wet conditions	min. value: 0.20 kN	No performance assessed.				
		mean value: 0.22 kN					

Table No. 12

Anchor description	Trade name		EJOT anchors with plate EJOT VT 90
	Assembly method		Surface assembly
	Plate diameter (mm)		90
MW board characteristics Frontrock MAX E (TR10)	Thickness (mm)		≥ 80
	Tensile strength (kPa)		≥ 10
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.59 kN mean value: 0.66 kN
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.48 kN mean value: 0.51 kN

Table No. 13

Anchor description	Trade name		Ejotharm anchors STR U 2G, KOELNER TFIX-8ST
	Assembly method		Countersunk assembly
	Plate diameter (mm)		60
MW panel characteristics Frontrock MAX E (TR10)	Thickness (mm)		≥ 100
	Tensile strength (kPa)		≥ 10
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.31 kN mean value: 0.36 kN
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.33 kN mean value: 0.37 kN

Table No. 14

Anchor description	Trade name		Anchors ejotherm STR U 2G with additional plate VT 2G
	Assembly method		Countersunk assembly
	Plate diameter (mm)		112.5
MW board characteristics Frontrock MAX E (TR10)	Thickness (mm)		≥ 100
	Tensile strength (kPa)		≥ 10
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.80 kN mean value: 0.84 kN
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.82 kN mean value: 0.86 kN

- Insulation product MW board FKD S Thermal (TR10)

Table No. 15

Anchor description	Trade name		See Annex No. 9	EJOT anchors see Annex No. 9
	Assembly method		Surface assembly	
	Plate diameter (mm)		60 or more	
MW board characteristics FKD S Thermal (TR10)	Thickness (mm)		≥ 60	≥ 100
	Tensile strength (kPa)		≥ 10	
Maximal load	Anchors placed at the body of the insulation product	R _{panel} in dry conditions	min. value: 0.36 kN mean value: 0.37 kN	min. value: 0.40 kN mean value: 0.44 kN
		R _{panel} in wet conditions	min. value: 0.18 kN mean value: 0.21 kN	No performance assessed.
	Anchors placed at joints of the insulation product	R _{joint} in dry conditions	min. value: 0.26 kN mean value: 0.30 kN	min. value: 0.30 kN mean value: 0.37 kN
		R _{joint} in wet conditions	min. value: 0.17 kN mean value: 0.19 kN	No performance assessed.

Table No. 16

Anchor description	Trade name		See Annex No. 9	Anchors ejotherm STR U 2G with additional plate VT 2G Annex No. 9	
	Assembly method		Countersunk assembly		
	Plate (mm)	diameter	≥ 60	112.5	
MW board characteristics Nobasil FKD S/ FKD S Thermal (TR10)	Thickness (mm)		≥ 100		
	Tensile (kPa)	strength	≥ 10		
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.36 kN mean value: 0.37 kN	min. value: 0.77 kN mean value: 0.91 kN	
		R_{panel} in wet conditions	min. value: 0.18 kN mean value: 0.21 kN	No performance assessed.	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.26 kN mean value: 0.30 kN	min. value: 0.60 kN mean value: 0.70 kN	
		R_{joint} in wet conditions	min. value: 0.17 kN mean value: 0.19 kN	No performance assessed.	

- Insulation product MW board Isover TF PROFI (TR10)

Table No. 17

Anchor description	Trade name		see Annex No. 9
	Assembly method		Surface assembly
	Plate diameter (mm)		60 or more
MW board characteristics Isover TF PROFI (TR10)	Thickness (mm)		≥ 50
	Tensile strength (kPa)		≥ 10
Maximal load	Anchors placed at the body of the insulation product	R _{panel} in dry conditions	min. value: 0.48 kN mean value: 0.55 kN
		R _{panel} in wet conditions	min. value: 0.37 kN mean value: 0.38 kN
	Anchors placed at joints of the insulation product	R _{joint} in dry conditions	min. value: 0.39 kN mean value: 0.43 kN
		R _{joint} in wet conditions	min. value: 0.29 kN mean value: 0.31 kN

Table No. 18

Anchor description	Trade name		Annex No. 9		Anchors ejotherm STR U 2G with additional plate VT 2G	
	Assembly method		Countersunk assembly			
	Plate diameter (mm)		60 or more		112.5	
MW panel characteristics Isover TF PROFI (TR10)	Thickness (mm)		≥ 100			
	Tensile strength (kPa)		≥ 10			
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.48 kN mean value: 0.55 kN		min. value: 0.91 kN mean value: 1.07 kN	
		R_{panel} in wet conditions	min. value: 0.37 kN mean value: 0.38 kN		No performance assessed	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.39 kN mean value: 0.43 kN		min. value: 0.66 kN mean value: 0.74 kN	
		R_{joint} in wet conditions	min. value: 0.29 kN mean value: 0.31 kN		No performance assessed	

- Insulation product MW board PAROC LINIO 10 (TR10)

Table No. 19

Anchor description	Trade name		See Annex No. 9	
	Assembly method		Surface assembly	Countersunk assembly
	Plate diameter (mm)		60 or more	
MW board characteristics PAROC LINIO 10 (TR10)	Thickness (mm)		≥ 50	≥ 100
	Tensile strength (kPa)		≥ 10	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.29 kN mean value: 0.31 kN	
		R_{panel} in wet conditions	min. value: 0.26 kN mean value: 0.27 kN	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.27 kN mean value: 0.29 kN	
		R_{joint} in wet conditions	min. value: 0.25 kN mean value: 0.26 kN	

- Insulation product MW board FASCROCK MAX (TR7.5)

Table No. 20

Anchor description	Trade name		See Annex No. 9	
	Assembly method		Surface assembly	Countersunk assembly
	Plate diameter (mm)		60 or more	
MW board characteristics FASCROCK MAX (TR7.5)	Thickness (mm)		≥ 80	≥ 130
	Tensile strength (kPa)		≥ 7.5	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.39 kN mean value: 0.43 kN	
		R_{panel} in wet conditions	min. value: 0.32 kN mean value: 0.34 kN	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.35 kN mean value: 0.38 kN	
		R_{joint} in wet conditions	min. value: 0.26 kN mean value: 0.28 kN	

- Insulation product MW board Heralan-PTP-035 (TR5)

Table No. 21

Anchor description	Trade name		See Annex No. 9	
	Assembly method		Surface assembly	Countersunk assembly
	Plate diameter (mm)		60 or more	
MW board characteristics Heralan-PTP-035 (TR5)	Thickness (mm)		≥ 50	≥ 100
	Tensile strength (kPa)		≥ 5	
Maximal load	Anchors placed at the body of the insulation product	R_{panel} in dry conditions	min. value: 0.25 kN mean value: 0.26 kN	
		R_{panel} in wet conditions	min. value: 0.13 kN mean value: 0.14 kN	
	Anchors placed at joints of the insulation product	R_{joint} in dry conditions	min. value: 0.21 kN mean value: 0.23 kN	
		R_{joint} in wet conditions	min. value: 0.08 kN mean value: 0.09 kN	

3.3.6 Render strip tensile test

- Base coat **STYRLEP-W 240/STYRLEP-W 240 EXTRA**

No performance assessed for glass fibre mesh **SSA-1363-4 SM**

Table No. 22

		Glass fibre mesh R 117 A101 / AKE 145 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	$\leq 0.05/1$	$\leq 0.05/2$	$\leq 0.10/5$	$\leq 0.15/10$
	Sample No. 2	-	-	$\leq 0.05/1$	$\leq 0.10/6$	$\leq 0.15/11$
	Sample No. 3	-	-	$\leq 0.10/2$	$\leq 0.15/4$	$\leq 0.20/9$
Weft	Sample No. 1	-	-	$\leq 0.05/3$	$\leq 0.10/5$	$\leq 0.15/9$
	Sample No. 2	-	$\leq 0.05/1$	$\leq 0.10/1$	$\leq 0.15/4$	$\leq 0.20/7$
	Sample No. 3	-	-	$\leq 0.05/2$	$\leq 0.10/4$	$\leq 0.10/10$

Table No. 23

		Glass fibre mesh R 131 A101 / AKE 160 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	-	$\leq 0.05/6$	$\leq 0.05/9$	$\leq 0.10/11$
	Sample No. 2	-	-	$\leq 0.05/4$	$\leq 0.10/8$	$\leq 0.15/11$
	Sample No. 3	-	-	$\leq 0.05/5$	$\leq 0.05/10$	$\leq 0.10/12$
Weft	Sample No. 1	-	$\leq 0.05/1$	$\leq 0.10/4$	$\leq 0.15/7$	$\leq 0.15/12$
	Sample No. 2	-	$\leq 0.05/1$	$\leq 0.05/5$	$\leq 0.10/8$	$\leq 0.15/13$
	Sample No. 3	-	-	$\leq 0.05/5$	$\leq 0.10/8$	$\leq 0.20/10$

Table No. 24

		Glass fibre mesh R 167 A101 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	-	$\leq 0.05/5$	$\leq 0.10/9$	$\leq 0.15/13$
	Sample No. 2	-	-	$\leq 0.05/3$	$\leq 0.05/8$	$\leq 0.10/12$
	Sample No. 3	-	-	$\leq 0.05/3$	$\leq 0.10/8$	$\leq 0.15/13$
Weft	Sample No. 1	-	-	-	$\leq 0.05/6$	$\leq 0.10/11$
	Sample No. 2	-	-	-	$\leq 0.05/4$	$\leq 0.10/8$
	Sample No. 3	-	-	-	$\leq 0.05/3$	$\leq 0.10/8$

Table No. 25

		Glass fibre mesh REDNET CB330 NOVA (manufacturer: ASGLATEX Ohorn GmbH)					
		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	-	-	-	$\leq 0.05/1$	$\leq 0.05/5$	$\leq 0.05/6$ $\leq 0.10/1$
	Sample No. 2	-	-	-	$\leq 0.05/1$	$\leq 0.05/5$	$\leq 0.05/5$ $\leq 0.10/2$
	Sample No. 3	-	-	-	$\leq 0.05/1$	$\leq 0.05/6$	$\leq 0.05/6$ $\leq 0.10/2$
Weft	Sample No. 1	-	-	-	-	$\leq 0.05/2$	$\leq 0.05/7$ $\leq 0.10/1$
	Sample No. 2	-	-	-	-	$\leq 0.05/1$	$\leq 0.05/4$
	Sample No. 3	-	-	-	-	$\leq 0.05/3$	$\leq 0.05/5$ $\leq 0.10/1$

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. 26

	Characteristic width of cracks W_{rk} [mm] at render strain value of 0.8%	
	Warp direction	Weft direction
R 117 A101 / AKE 145	0.156	0.123
R 131 A101 / AKE 160	0.000	0.138
R 167 A101	0.050	0.000
REDNET CB330 NOVA	0.000	0.000

The width of cracks in reinforced base coat at 2% elongation is equal or lower than 0.20 mm.

- Base coat **STYRLEP-B 225**

No performance assessed for glass fibre mesh **SSA-1363-4 SM**

Table No. 27

		Glass fibre mesh R 117 A101 / AKE 145 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	-	$\leq 0.05/4$	$\leq 0.10/6$	$\leq 0.15/8$
	Sample No. 2	-	-	$\leq 0.05/5$	$\leq 0.10/6$	$\leq 0.15/10$
	Sample No. 3	-	-	$\leq 0.05/3$	$\leq 0.10/5$	$\leq 0.15/9$
Weft	Sample No. 1	-	$\leq 0.05/3$	$\leq 0.10/6$	$\leq 0.15/9$	$\leq 0.20/12$
	Sample No. 2	-	$\leq 0.05/3$	$\leq 0.10/7$	$\leq 0.15/8$	$\leq 0.20/13$
	Sample No. 3	-	$\leq 0.05/3$	$\leq 0.10/6$	$\leq 0.15/9$	$\leq 0.20/12$

Table No. 28

		Glass fibre mesh R 131 A101 / AKE 160 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	-	$\leq 0.05/4$	$\leq 0.10/8$	$\leq 0.15/12$
	Sample No. 2	-	-	$\leq 0.05/3$	$\leq 0.10/9$	$\leq 0.15/14$
	Sample No. 3	-	-	$\leq 0.05/3$	$\leq 0.10/7$	$\leq 0.15/12$
Weft	Sample No. 1	-	-	$\leq 0.05/5$	$\leq 0.10/8$	$\leq 0.15/11$
	Sample No. 2	-	-	$\leq 0.05/5$	$\leq 0.10/9$	$\leq 0.15/14$
	Sample No. 3	-	-	$\leq 0.05/4$	$\leq 0.10/9$	$\leq 0.15/13$

Table No. 29

		Glass fibre mesh R 167 A101 (manufacturer: SAINT-GOBAIN ADFORS CZ s.r.o.)				
		Crack width W_{typ} [mm]/ number of cracks at relative elongation ϵ				
Load direction		$\epsilon = 0.3 \%$	$\epsilon = 0.5 \%$	$\epsilon = 0.8 \%$	$\epsilon = 1.0 \%$	$\epsilon = 2.0 \%$
Warp	Sample No. 1	-	-	-	$\leq 0.05/7$	$\leq 0.10/10$
	Sample No. 2	-	-	-	$\leq 0.05/9$	$\leq 0.10/12$
	Sample No. 3	-	-	-	$\leq 0.05/8$	$\leq 0.10/11$
Weft	Sample No. 1	-	-	-	$\leq 0.05/7$	$\leq 0.10/13$
	Sample No. 2	-	-	-	$\leq 0.05/6$	$\leq 0.10/15$
	Sample No. 3	-	-	-	$\leq 0.05/9$	$\leq 0.10/14$

Table No. 30

		Glass fibre mesh REDNET CB330 NOVA (manufacturer: ASGLATEX Ohorn GmbH)					
		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	-	-	-	$\leq 0.05/1$	$\leq 0.05/4$	$\leq 0.05/4$ $\leq 0.10/1$
	Sample No. 2	-	-	-	-	$\leq 0.05/3$	$\leq 0.05/5$
	Sample No. 3	-	-	-	$\leq 0.05/1$	$\leq 0.05/4$	$\leq 0.05/5$ $\leq 0.10/1$
Weft	Sample No. 1	-	-	-	-	-	$\leq 0.05/3$
	Sample No. 2	-	-	-	-	-	$\leq 0.05/2$
	Sample No. 3	-	-	-	-	-	$\leq 0.05/3$

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. 31

	Characteristic width of cracks W_{rk} [mm] at render strain value of 0.8%	
	Warp direction	Weft direction
R 117 A101 / AKE 145	0.050	0.100
R 131 A101 / AKE 160	0.050	0.050
R 167 A101	0.000	0.000
REDNET CB330 NOVA	0.000	0.000

The width of cracks in reinforced base coat at 2% elongation is equal or lower than 0.20 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:

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

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. 32

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 29/03/2017



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 | Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Frontrock MAX E (double density, TR10) |
| Annex No. 4 | Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Nobasil FKD S/ FKD S Thermal (TR10) |
| Annex No. 5 | Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Isover TF PROFI (TR10) |
| Annex No. 6 | Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board ISOPANEL (TR10) |
| Annex No. 7 | Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW double density board ISOPANEL FASROCK MAX (TR7,5) |
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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 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 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	---	≥ 50 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+A1:2015.

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 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 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+A1:2015.

Annex No. 3 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Frontrock MAX E (double density, TR10)

Description and characteristics		Regulation	Declared characteristics MW panel Frontrock MAX E (double density, TR10)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density $\leq 150 \text{ kg/m}^3$
Thermal resistance			Defined in CE mark in accordance with EN 13162	
Thickness		EN 823	T5	-1 % or -1 mm*, +3 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	max. 1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR10	$\geq 10 \text{ kPa}$
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	$\geq 5 \text{ kPa}$
Shear strength		EN 12090	---	---
Shear modulus of elasticity		EN 12090	---	---

* - highest value applies

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

Annex No. 4 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board FKD S Thermal (TR10)

Description and characteristics		Regulation	Declared characteristics MW board FKD S Thermal (TR10)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 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	---	≥ 5 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+A1:2015.

Annex No. 5 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Isover TF PROFI (TR10)

Description and characteristics		Regulation	Declared characteristics MW board Isover TF PROFI (TR10)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 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	---	≥ 5 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+A1:2015.

Annex No. 6 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board ISOPANEL (TR10)

Description and characteristics		Regulation	Declared characteristics MW board ISOPANEL (TR10)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 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	---	≥ 5 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+A1:2015.

Annex No. 7 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW double density board FASROCK MAX (TR7,5)

Description and characteristics		Regulation	Declared characteristics MW board FASROCK MAX (TR7.5)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR5	≥ 7.5 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 3.0 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+A1:2015.

Annex No. 8 Insulation product characteristics for mechanically fixed ETICS with additional bonding – MW board Heralan-PTP-035 (TR5)

Description and characteristics		Regulation	Declared characteristics MW board Heralan-PTP-035 (TR5)	
			Class, level according to EN 13162	Value
Reaction to fire		EN 13501 -1+A1:2009	A1	Apparent density ≤ 150 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	max. 1
Tensile strength perpendicular to the faces of insulation product in dry conditions		EN 1607	TR5	≥ 5.0 kPa
Tensile strength perpendicular to the faces of insulation product in wet conditions		ETAG 004	---	≥ 2.2 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+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 NT U	60	See ETA-05/0009	0.60	2.43
Ejotherm STR U. STR U 2G	60	See ETA-04/0023	0.60	2.08
Ejotherm NTK U	60	See ETA-07/0026	0.50	1.44
EJOT H1 eco. EJOT H4 eco	60	See ETA-11/0192	0.60	1.40
EJOT H3	60	See ETA-14/0130	0.60	1.25
KOELNER KI-10. KI-10PA	60	See ETA-07/0291	0.39	0.81
KOELNER KI-10M			0.45	0.85
KOELNER KI-10N. KI-10NS	60	See ETA 07/0221	0.50	1.23
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
KOELNER TFIX-8P	60	See ETA-13/0845	0.30	1.38
WKRET - MET LFN ø 10	60	See ETA-06/0105	0.70	1.36
WKRET - MET LFM ø 10			0.70	1.21
WKRET - MET LFN ø 8	60	See ETA-06/0080	0.50	1.28
WKRET - MET LFM ø 8			0.50	1.26
WKRET - MET LTX ø 10	60	See ETA-08/0172	0.40	1.64
WKRET - MET LMX ø 10				
WKRET - MET LTX ø 8	60	See ETA-09/0001	0.50	1.53
WKRET - MET LMX ø 8				
FIXPLUG ø 8	60	See ETA-11/0231	0.60	1.70
FIXPLUG ø 10			0.60	1.50
WK THERM ø 8	60	See ETA-11/0232	0.60	4.30
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

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
KEW TSD 8	60	See ETA-04/0030	0.60	1.60
KEW TSBD	60	See ETA-08/0314	1.60	2.22
KEW TSBDL				
KEW TSD-V	60	See ETA-08/0315	1.20	1.75
KEW TSDL-V	60	See ETA-12/0148	1.20	1.75
KEW TSD-V KN	60	See ETA-13/0075	1.20	1.75
fischer TERMOZ 8U	60	See ETA-02/0019	0.50	2.45
fischer TERMOZ 8UZ			0.50	0.54
fischer TERMOZ 8N	60	See ETA-03/0019	0.50	1.34
fischer TERMOZ 8NZ			0.50	1.43
Hilti-Dämmstoff-Befestigungselement XI-FV	60	See ETA-03/0004	0.40	1.60
Hilti SX-FV	60	See ETA-03/0005	0.70	1.73
Hilti SD-FV 8	60	See ETA-03/0028	0.30	1.55
Hilti WDVS-Schlagdübel SDK-FV 8	60	See ETA-07/0302	0.50	1.48
Hilti WDVS- Schraubdübel D-FV. D-FV T	60	See ETA-05/0039	0.80	1.93
Countersunk assembly				
Ejotharm STR U, STR U 2G	60	See ETA - 04/0023	0.60	2.08
KOELNER TFIX-8ST	60	See ETA - 11/0144	0.60	2.04
Klimas Wkret-med screw-in plug eco-drive	60	See ETA-13/0107	0.60	2.80
Klimas Wkret-med screw-in plug eco-drive S				
KEW TSBD	60	See ETA - 08/0314	1.60	2.22
KEW TSBDL				

In addition to this list, anchors assessed in accordance with 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:	≥ 0.3 kN/mm
	Countersunk assembly:	≥ 0.6 kN/mm
Rupture force of anchor's plate	$\geq$ Higher of figures R_{panel} and R_{joint} in relevant table in Cl. 3.3.5	

Annex No. 10 Description of the glass fibre meshes

	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 (%)
R 117 A101 / AKE 145	4.0 × 4.5 mm	≥ 20	≥ 50
R 131 A101 / AKE 160	3.5 × 3.8 mm		
R 167 A101	6.0 × 7.0 mm		
SSA-1363-4 SM	4.0 × 5.0 mm		

	Description	Strength after ageing	
	Reinforced fibre mesh applied in one layer with aperture size	Absolute strength after ageing (N/mm)	Relative residual strength after ageing, of the strength in the as-delivered state (%)
REDNET CB330 NOVA	6.0 × 5.0 mm	≥ 20	≥ 40

