

# European Technical Assessment



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## European Technical Assessment

**ETA-21/0304**  
of 30/04/2021

### General Part

**Technical Assessment Body issuing the European Technical Assessment:**  
Łukasiewicz Research Network – Institute of Ceramics and Building Materials

<b>Trade name of the construction product</b>	STAINER STS
<b>Product family to which the construction product belongs</b>	04: External Thermal Insulation Composite Systems (ETICS) with renderings
<b>Manufacturer</b>	STAINER Sp. z o.o. Dworcowa 152, 64-120 Krzemieniewo, POLAND
<b>Manufacturing plants</b>	STAINER Sp. z o.o. Dworcowa 152, 64-120 Krzemieniewo, POLAND
<b>This European Technical Assessment contains</b>	24 pages including 3 Annexes which form an integral part of this assessment.  Annex No 4 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated.
<b>This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of</b>	EAD 040083-00-0404 ed. January 2019 – External Thermal Insulation Composite Systems (ETICS) with renderings

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## Specific part

### 1. Technical description of the product:

This product STAINER STS is an ETICS (External Thermal Insulation Composite System with rendering) - a kit comprising components which are factory-produced by the manufacturer or component suppliers. The ETICS manufacturer is ultimately responsible for all components of the ETICS specified in this ETA.

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene (EPS) to be bonded onto a wall. The method of fixing and the relevant components are specified in Table 1. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer.

The ETICS may include special fittings (e.g. base profiles, corner profiles) to treat details of ETICS (connections, apertures, corners, parapets, sills). Assessment and performance of these components is not addressed in this ETA, however the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

Table 1.

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
	<b>Bonded ETICS; fully or partially bonded with supplementary mechanical fixings. National application documents shall be taken into account.</b>		
<b>Insulation materials with associated methods of fixing</b>	<ul style="list-style-type: none"> <li><b>Insulation product:</b> Boards of expanded polystyrene (EPS) according to EN 13163 <i>Product characteristics - see Annex No 1</i></li> </ul>	-	50 to 300
	<ul style="list-style-type: none"> <li><b>Adhesives:</b> <ul style="list-style-type: none"> <li>- <b>STAINER S</b> Cement based powder requiring addition of 0,22-0,24 l/kg of water</li> <li>- <b>STAINER U</b> Cement based powder requiring addition of 0,22-0,24 l/kg of water</li> </ul> </li> </ul>	4,0 to 5,0 (powder)	-
	<ul style="list-style-type: none"> <li><b>Supplementary mechanical fixings:</b> Plastic anchors covered by relevant ETA</li> </ul>	-	-

Table 1. cont.

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
<b>Base coat</b>	<ul style="list-style-type: none"> <li>- <b>STAINER U</b> Cement based powder requiring addition of 0,22-0,24 l/kg of water</li> </ul>	4,0 to 5,0	3,0 to 4,0
<b>Reinforcement</b>	<ul style="list-style-type: none"> <li>• <b>Standard glass fibre meshes:</b> <ul style="list-style-type: none"> <li>- AKE 145</li> <li>- AKE 170</li> <li>- E107K</li> <li>- E121L</li> <li>- E118L</li> <li>- E132L</li> <li>- STAINER 145</li> <li>- STAINER 160</li> <li>- FF 145</li> <li>- FF 150</li> <li>- FF 160</li> <li>- CE 1</li> <li>- CE 2</li> <li>- CE 3</li> <li>- CE 4</li> <li>- CE 6</li> <li>- CE 7</li> <li>- CE 8</li> <li>- CE 10</li> <li>- CE 11</li> <li>- CE 1/110</li> <li>- CE 2/110</li> <li>- CE 3/110</li> <li>- CE 4/110</li> <li>- CE 6/110</li> <li>- CE 7/110</li> <li>- CE 8/110</li> <li>- CE 10/110</li> <li>- CE 11/110</li> </ul> </li> </ul> <p><i>Products characteristics - see Annex No 2</i></p>	-	-
<b>Primers</b>	<ul style="list-style-type: none"> <li>• <b>STAINER UG</b> Ready to use liquid to be used on the substrate</li> <li>• <b>STAINER TG</b> Ready to use liquid to be used on the substrate</li> </ul>	0,1 to 0,3	-

Table 1. cont.

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
Key coats	<ul style="list-style-type: none"> <li>• <b>STAINER AG</b> Ready to use paste to be used with finishing coats: STAINER AP and STAINER AM</li> </ul>	0,2 to 0,3	-
	<ul style="list-style-type: none"> <li>• <b>STAINER SG</b> Ready to use paste to be used with finishing coats: STAINER MP, STAINER SP / STAINER REGEN and STAINER XP</li> </ul>	0,2 to 0,3	-
Finishing coats	<ul style="list-style-type: none"> <li>• Mineral finishing coat <b>STAINER MP</b> Cement based powder requiring addition of 0,23-0,27 l/kg of water structure - max. particles size: floated - 1,5; 2,0 mm</li> </ul>	2,0 to 4,0	Regulated by particles size
	<ul style="list-style-type: none"> <li>• Acrylic finishing coats <b>STAINER AP</b> Ready to use paste – acrylic binder: structure - max. particles size: floated - 1,5; 2,0 mm</li> </ul>	2,4 to 2,6	
	<ul style="list-style-type: none"> <li>• Acrylic finishing coats <b>STAINER AM</b> Ready to use paste – acrylic binder: structure - max. particles size: mosaic - 1,5 mm</li> </ul>	4,0 to 4,5	
	<ul style="list-style-type: none"> <li>• Silicone finishing coat <b>STAINER SP / STAINER REGEN</b> Ready to use paste – silicone-acrylic binder: structure - max. particles size: ribbed - 1,5; 2,0 mm</li> </ul>	2,4 to 2,6	
Decorative coat (paint)	<ul style="list-style-type: none"> <li>• Silicone finishing coat <b>STAINER XP</b> Ready to use paste – silicone-silicate binder: structure - max. particles size: floated - 1,5; 2,0 mm</li> </ul>	2,4 to 2,6	
	<ul style="list-style-type: none"> <li>• Silicone decorative coat <b>STAINER SILIKON</b> Ready to use pigmented liquid to be used obligatory with mineral and optionally with silicone finishing coats</li> </ul>	0,15 to 0,22 l/m <sup>2</sup>	-
Ancillary materials	Remain under the manufacturer's responsibilities		

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

This ETICS is intended to be used on new or existing (retrofit) vertical building walls. The ETICS may also be used on horizontal or inclined surfaces which are not exposed to precipitation. The ETICS gives the building wall to which it is applied additional thermal insulation and protection from effects of weathering. ETICS are non-load-bearing construction elements. They do not contribute directly to the stability of the building wall on which they are installed.

ETICS are not intended to ensure the air tightness of the building structure.

Concerning product packaging, transport and storage it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport and storage, as he considers necessary in order to reach the declared performances.

The information about installation is provided with the technical documentation from the Manufacturer and it is assumed that the product will be installed according to it or (in absence of such instructions) according to the usual practice of the building professionals.

The performances assessed in this European Technical Assessment, according to the applicable EAD, are based on an assumed intended working life of at least 25 years, provided that the conditions for the installation, packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

The ETICS belongs to Category S/W2 according to EOTA Technical Report No 034.

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

The tests for performance assessment of STAINER STS were carried out in compliance with EAD 040083-00-0404 according to the test methods reported herein, as well for what concerns sampling, conditioning and testing provisions. The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Section 1 of the ETA and the relative Annexes 1 ÷ 2. The numbering in the following tables corresponds to the numbering of Table 1 of EAD 040083- 00-0404.

**3.1. Safety in case of fire (BWR 2)**

**3.1.1. Reaction to fire (EAD 040083-00-0404: clause 2.2.1, EN 13501-1)**

**3.1.1.1. Reaction to fire of ETICS (EAD 040083-00-0404: clause 2.2.1.1)**

Table 2.

Configuration	Max. heat of combustion [MJ/kg]	Flame retardant content	Euroclass acc. to EN 13501-1
Primer	31,51	No flame retardant	B-s1, d0
Adhesive	0,18		
EPS boards* <i>density ≤ 14,5 kg/m<sup>3</sup></i>	-		
Base coat	0,20		
Glass fibre mesh (double layer)	8,38 x 2		
Key coat	3,33		
Finishing coat	1,66		
Decorative coat	4,48		

**3.1.1.2. Reaction to fire of the thermal insulation material (EAD 040083-00-0404: clause 2.2.1.2)**

See Annex No 1.

**3.1.1.3. Reaction to fire of PU foam adhesive (EAD 040083-00-0404: clause 2.2.1.3)**

Not relevant

**3.1.2. Façade fire performance (EAD 040083-00-0404: clause 2.2.2)**

No performance assessed

**3.1.3. Propensity to undergo continuous smouldering of ETICS (EAD 040083-00-0404: clause 2.2.3)**

No performance assessed

**3.2. Hygiene, health and environment (BWR 3)**

**3.2.1. Content, emission and/or release of dangerous substances – leachable substances (EAD 040083-00-0404: clause 2.2.4, EOTA TR034)**

No performance assessed.

Note: There may be requirements applicable to the ETICS falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No 305/2011, these requirements need to be complied with, when and where they apply.

**3.2.2. Water absorption (EAD 040083-00-0404: clause 2.2.5)**

**3.2.2.1. Water absorption of the base coat and the rendering system (EAD 040083-00-0404: clause 2.2.5.1)**

- Base coat STAINER U:
  - Water absorption after 1 hour = 0,1 kg/m<sup>2</sup>
  - Water absorption after 24 hours = 0,2 kg/m<sup>2</sup>
- Rendering systems: Table 3.

Table 3.

		Water absorption after 1 hour	Water absorption after 24 hours
		mean value [kg/m <sup>2</sup> ]	
<b>Rendering system:</b>  Base coat: STAINER U + relevant key coat + finishing coat indicated hereafter + decorative coat (if used):	STAINER MP + STAINER SILIKON	0,1	0,4
	STAINER AP	0,1	0,4
	STAINER AM	0,1	0,2
	STAINER SP / STAINER REGEN	0,1	0,3
	STAINER XP	0,1	0,3

**3.2.2.2. Water absorption of the thermal insulation product (EAD 040083-00-0404: clause 2.2.5.2)**

See Annex No 1.

**3.2.3. Water-tightness of the ETICS: Hygrothermal behaviour (EAD 040083-00-0404: clause 2.2.6)**

Hygrothermal cycles have been performed on a rig in hygrothermal chamber. None of the following defects occurred during the testing:

- blistering or peeling of any finishing coat,
- failure or cracking associated with joints between insulation product boards,
- detachment of render,
- cracking allowing water penetration to the insulation layer.

The ETICS is so assessed resistant to hygrothermal cycles.

**3.2.4. Water-tightness: Freeze-thaw performance (EAD 040083-00-0404: clause 2.2.7)**

Water absorption of both, base coat and the rendering systems after 24 hours was lower than 0,5 kg/m<sup>2</sup> (tab. 4).

ETICS is so assessed resistant to freeze-thaw cycles.

**3.2.5. Impact resistance tested on the rig (EAD 040083-00-0404: clause 2.2.8)**

Table 4.

		Hard body impact		
		Impact energy 3 J	Impact energy 10 J	Impact resistance category
Single layer of standard mesh AKE 145		Impact diameter (mm) / damages		Impact resistance category
<b>Rendering system:</b>  Base coat: <u>STAINER U</u> + relevant key coat + finishing coat indicated hereafter:	STAINER AP, floated 1,5 mm	25 / cracks without reaching the thermal insulation product	36 / cracks without reaching the thermal insulation product	
	STAINER AM, mosaic 1,5 mm	16 / superficial damages without cracks formation	29 / cracks without reaching the thermal insulation product	II
	STAINER SP / STAINER REGEN, floated 1,5 mm	20 / cracks without reaching the thermal insulation product	30 / cracks without reaching the thermal insulation product	III
	STAINER XP, floated 1,5 mm	13 / superficial damages without cracks formation	29 / cracks without reaching the thermal insulation product	II

3.2.6. Impact resistance not tested on the rig (EAD 040083-00-0404: clause 2.2.8)

Table 5.

		Hard body impact		
		Impact energy 3 J	Impact energy 10 J	Impact resistance category
<b>Single layer of standard mesh AKE 145</b>		<b>Impact diameter (mm) / damages</b>		
<b>Rendering system:</b>  Base coat: <u>STAINER U</u> + relevant key coat + finishing coat indicated hereafter + decorative coat:	STAINER MP, floated 1,5 mm + STAINER SILIKON	6 / superficial damages without cracks formation	19 / cracks without reaching the thermal insulation product	II

Table 6.

		Hard body impact		
		Impact energy 3 J	Impact energy 10 J	Impact resistance category
<b>Double layer of standard mesh AKE 145</b>		<b>Impact diameter (mm) / damages</b>		
<b>Rendering system:</b>  Base coat: <u>STAINER U</u> + relevant key coat + finishing coat indicated hereafter + decorative coat (if used):	STAINER MP, floated 1,5 mm + STAINER SILIKON	11 / superficial damages without cracks formation	26 / cracks without reaching the thermal insulation product	II
	STAINER AP, floated 1,5 mm	0 / superficial damages without cracks formation	22 / cracks without reaching the thermal insulation product	II
	STAINER AM, mosaic 1,5 mm	4 / superficial damages without cracks formation	18 / cracks without reaching the thermal insulation product	II
	STAINER SP / STAINER REGEN, floated 1,5 mm	4 / superficial damages without cracks formation	26 / cracks without reaching the thermal insulation product	II
	STAINER XP, floated 1,5 mm	0 / superficial damages without cracks formation	17 / superficial damages without cracks formation	I

**3.2.7. Water vapour permeability (EAD 040083-00-0404: clause 2.2.9)**

**3.2.7.1. Water vapour permeability of the rendering system (equivalent air thickness  $s_d$ ) (EAD 040083-00-0404: clause 2.2.9.1)**

Table 7.

		Equivalent air thickness $s_d$
<b>Rendering system:</b>  Base coat: STAINER U + relevant key coat + finishing coat indicated hereafter + decorative coat (if used):	STAINER MP, floated 2,0 mm + STAINER SILIKON	0,10 m
	<i>thickness of rendering: 6,0 mm</i>	
	STAINER AP, floated 2,0 mm	0,20 m
	<i>thickness of rendering: 6,0 mm</i>	
	STAINER AM, mosaic 1,5 mm	0,30 m
	<i>thickness of rendering: 5,5 mm</i>	
	STAINER SP / STAINER REGEN, floated 2,0 mm + STAINER SILIKON	0,20 m
	<i>thickness of rendering: 6,1 mm</i>	
STAINER XP, floated 2,0 mm	0,10 m	
<i>thickness of rendering: 6,0 mm</i>		

**3.2.7.2. Water vapour permeability of the thermal insulation product (water-vapour resistance factor) (EAD 040083-00-0404: clause 2.2.9.2)**

See Annex No 1.

**3.3. Safety and accessibility in use (BWR 4)**

**3.3.1. Bond strength (EAD 040083-00-0404: clause 2.2.11)**

**3.3.1.1. Bond strength between the base coat and the thermal insulation product (EAD 040083-00-0404: clause 2.2.11.1)**

Table 8.

		Bond strength (kPa)	
		mean	min
STAINER U	initial state	80*	74
	hygrothermal cycles (from the rig)	80*	79
	freeze-thaw cycles	test not required	

\*cohesive rupture in insulation

**3.3.1.2. Bond strength between the adhesive and the substrate (EAD 040083-00-0404: clause 2.2.11.2)**

Table 9.

		Bond strength (kPa)	
		mean	min
STAINER S**	initial state	480*	411
	48 h immersion in water + 2 hours 23°C/50% RH	650*	474
	48 h immersion in water + 7 days 23°C/50% RH	1600*	1382
STAINER U**	initial state	610*	454
	48 h immersion in water + 2 hours 23°C/50% RH	530*	482
	48 h immersion in water + 7 days 23°C/50% RH	1490*	1288

\*adhesive rupture; \*\*thickness of adhesive – 3 mm

Minimal bonded surface area: S = 43 %.

**3.3.1.3. Bond strength between the adhesive and the thermal insulation product (EAD 040083-00-0404: clause 2.2.11.3)**

Table 10.

		Bond strength (kPa)	
		mean	min
STAINER S***	initial state	80*	69
	48 h immersion in water + 2 hours 23°C/50% RH	40**	36
	48 h immersion in water + 7 days 23°C/50% RH	80*	65
STAINER U***	initial state	80*	70
	48 h immersion in water + 2 hours 23°C/50% RH	50**	38
	48 h immersion in water + 7 days 23°C/50% RH	80*	74

\*cohesive/adhesive rupture; \*\* adhesive rupture; \*\*\* thickness of adhesive – 3 mm

Minimal bonded surface area: S = 43 %.

**3.3.2. Fixing strength (transverse displacement test) (EAD 040083-00-0404: clause 2.2.12)**

Test not required because the ETICS fulfils the following criteria:  $E \times d < 50000 \text{ N/mm}$ .  
(E: modulus of elasticity of the base coat - d: mean thickness of the base coat).

**3.3.3. Wind load resistance of ETICS (EAD 040083-00-0404: clause 2.2.13)**

The ETICS STAINER STS is not foreseen to be mechanically fixed in any way (neither using anchors, nor using profiles). Supplementary mechanical fixings are foreseen to be used only where necessary to provide stability until adhesive has dried and as an ancillary component without any contribution to wind-load resistance.

**3.3.3.1. Pull-through test of fixings (EAD 040083-00-0404: clause 2.2.13.1)**

Not relevant

**3.3.3.2. Static foam block test (EAD 040083-00-0404: clause 2.2.13.2)**

Not relevant

**3.3.3.3. Dynamic wind uplift test (EAD 040083-00-0404: clause 2.2.13.3)**

Not relevant

**3.3.4. Tensile test perpendicular to the faces of thermal insulation product (EAD 040083-00-0404: clause 2.2.14)**

See Annex No 1.

**3.3.5. Shear strength and shear modulus of elasticity test of ETICS (EAD 040083-00-0404: clause 2.2.15)**

See Annex No 1.

**3.3.6. Render strip tensile test (EAD 040083-00-0404: clause 2.2.17)**

Performance was not assessed.

**3.3.7. Bond strength after ageing (EAD 040083-00-0404: clause 2.2.20)**

**3.3.7.1. Bond strength after ageing of finishing coat tested on the rig (EAD 040083-00-0404: clause 2.2.20.1)**

Table 11.

		Bond strength after hygrothermal cycles (kN/m <sup>2</sup> )	
		mean value	individual values
<b>Rendering system:</b> Base coat: <u>STAINER U</u> + relevant key coat + finishing coat indicated hereafter:	STAINER AP	80	78*; 80**; 82**; 82**, 80**
	STAINER AM	80	77*; 81**; 80**; 80**, 80**
	STAINER SP / STAINER REGEN	80	80**; 81**; 70*; 80**, 82**
	STAINER XP	80	82**; 80**; 70*; 80**, 80**

\*100% cohesive rupture in insulation; \*\*cohesive rupture in insulation

**3.3.7.2. Bond strength after ageing of finishing coat not tested on the rig (EAD 040083-00-0404: clause 2.2.20.2)**

Table 12.

		Bond strength after hygrothermal cycles (kN/m <sup>2</sup> )	
		mean value	individual values
<b>Rendering system:</b> Base coat: <u>STAINER U</u> + relevant key coat + finishing coat indicated hereafter + decorative coat (if used):	STAINER MP + STAINER SILIKON	80	69*; 80**; 80**; 80**, 76*

\*100% cohesive rupture in insulation; \*\*cohesive rupture in insulation

**3.3.8. Mechanical and physical characteristics of the mesh (EAD 040083-00-0404: clause 2.2.21)**

**3.3.8.1. Tensile strength and elongation of the glass fibre mesh in the as-delivered (EAD 040083-00-0404: clause 2.2.21.1)**

Table 13.

	Average tensile strength in the as-delivered state (N/mm)		Average elongation in the as-delivered state (%)	
	warp	weft	warp	weft
AKE 145	45,7	39,3	4,81	4,74
AKE 170	47,8	44,7	4,45	4,38
E107K	39,0	39,0	3,89	3,79
E121L	32,0	36,0	3,58	3,25
E118L	43,0	41,0	3,34	3,34
E132L	43,0	48,0	3,56	3,60
STAINER 145	43,0	41,0	3,34	3,34
STAINER 160	43,0	48,0	3,56	3,60
FF 145*	35,0	50,0	3,7	4,0
FF 145**	38,0	48,0	3,7	3,6
FF 150*	49,0	43,0	3,9	3,7
FF 160**	47,0	49,0	3,9	3,4
CE 1	51,1	44,8	3,8	4,0
CE 2	48,7	44,9	4,3	4,4
CE 3	41,3	46,7	4,2	5,0
CE 4	45,2	61,8	4,3	4,7
CE 6	28,5	29,7	5,2	5,7
CE 7	39,1	38,8	4,8	4,9
CE 8	40,6	40,8	4,7	4,8
CE 10	31,5	37,1	4,3	4,2
CE 11	32,6	34,1	4,3	4,2
CE 1/110	51,1	44,8	3,8	4,0
CE 2/110	48,7	44,9	4,3	4,4
CE 3/110	41,3	46,7	4,2	5,0
CE 4/110	45,2	61,8	4,3	4,7
CE 6/110	28,5	29,7	5,2	5,7
CE 7/110	39,1	38,8	4,8	4,9
CE 8/110	40,6	40,8	4,7	4,8
CE 10/110	31,5	37,1	4,3	4,2
CE 11/110	32,6	34,1	4,3	4,2

\*plant Slovakia; \*\* plant Macedonia

**3.3.8.2. Tensile strength and elongation of the glass fibre mesh after ageing state (EAD 040083-00-0404: clause 2.2.21.2)**

Table 14.

	Average tensile strength after ageing (N/mm)		Residual strength after ageing (%)		Average elongation after ageing (%)	
	warp	weft	warp	weft	warp	weft
AKE 145	24,8	20,8	54,3	52,9	2,74	2,39
AKE 170	28,1	33,2	58,8	74,3	2,92	3,05
E107K	24,0	27,0	61,5	69,2	2,17	2,34
E121L	22,0	36,00	68,8	100,0	2,64	3,34
E118L	23,0	29,0	53,5	70,7	1,87	2,36
E132L	26,0	29,0	60,5	60,4	2,15	2,17
STAINER 145	23,0	29,0	53,5	70,7	1,87	2,36
STAINER 160	26,0	29,0	60,5	60,4	2,15	2,17
FF 145*	20,0	29,0	57,1	58,0	2,2	2,4
FF 145**	22,0	35,0	57,9	72,9	2,1	2,6
FF 150*	27,0	24,0	55,1	55,8	2,2	2,2
FF 160**	27,0	36,0	57,4	73,5	2,3	2,5
CE 1	27,8	28,9	54,4	64,5	2,1	2,6
CE 2	26,1	26,0	53,6	57,9	2,4	2,4
CE 3	20,8	24,1	50,4	51,6	1,8	1,7
CE 4	23,6	31,0	52,2	50,2	1,8	1,9
CE 6	24,0	26,0	84,2	87,5	4,2	3,4
CE 7	24,5	22,6	62,7	58,2	2,9	2,8
CE 8	27,4	21,3	67,5	52,2	2,9	2,5
CE 10	29,1	33,6	92,4	90,6	3,6	3,4
CE 11	25,5	24,2	78,2	71,0	2,6	2,6
CE 1/110	27,8	28,9	54,4	64,5	2,1	2,6
CE 2/110	26,1	26,0	53,6	57,9	2,4	2,4
CE 3/110	20,8	24,1	50,4	51,6	1,8	1,7
CE 4/110	23,6	31,0	52,2	50,2	1,8	1,9
CE 6/110	24,0	26,0	84,2	87,5	4,2	3,4

Table 14. cont.

	Average tensile strength after ageing (N/mm)		Residual strength after ageing (%)		Average elongation after ageing (%)	
	warp	weft	warp	weft	warp	weft
CE 7/110	24,5	22,6	62,7	58,2	2,9	2,8
CE 8/110	27,4	21,3	67,5	52,2	2,9	2,5
CE 10/110	29,1	33,6	92,4	90,6	3,6	3,4
CE 11/110	25,5	24,2	78,2	71,0	2,6	2,6

\*plant Slovakia; \*\* plant Macedonia

### 3.4. Protection against noise (BWR 5)

#### 3.4.1. Airborne sound insulation of ETICS (EAD 040083-00-0404: clause 2.2.22)

##### 3.4.1.1. Airborne sound insulation of ETICS (EAD 040083-00-0404: clause 2.2.22.1)

No performance assessed.

##### 3.4.1.2. Dynamic stiffness of the thermal insulation product (EAD 040083-00-0404: clause 2.2.22.2)

No performance assessed.

##### 3.4.1.3. Air flow resistance of the thermal insulation product (EAD 040083-00-0404: clause 2.2.22.3)

No performance assessed.

### 3.5. Energy economy and heat retention (BWR 6)

#### 3.5.1. Thermal resistance and thermal transmittance of ETICS (EAD 040083-00-0404: clause 2.2.23)

The additional thermal resistance provided by the ETICS ( $R_{ETICS}$ ) to the substrate has been assessed by calculations on the basis of the thermal resistance of the thermal insulation product ( $R_{insulation}$ ) and from either the tabulated ( $R_{render}$ ) value of the render system [about 0,02 in  $(m^2 \cdot K)/W$ ].

$$R_{ETICS} = R_{insulation} + R_{render}$$

as described in EN ISO 10456.

Table 15.

Thermal resistance $R_{ETICS}$ with minimum thickness of EPS* [[ $m^2 \cdot K$ ]/W]	Thermal resistance $R_{ETICS}$ with maximum thickness of EPS** [[ $m^2 \cdot K$ ]/W]
1,131	8,147

\*at maximum value of thermal conductivity 0,045 W/(m · K); \*\*assumed value of thermal conductivity 0,037 W/(m · K)

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

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

where:

$\chi_p \cdot n$  has only to be taken into account if it is greater than 0,04 W/(m<sup>2</sup>·K)

$U_c$ : corrected thermal transmittance of the entire wall (W/ (m<sup>2</sup>·K))

$n$ : number of anchors (through insulation product) per 1 m<sup>2</sup>

$\chi_p$ : point thermal transmittance value of the anchor (W/K). 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 plastic screw/nail, stainless steel screw/nail with the head covered by at least 15 mm plastic material, or with a minimum 15 mm air gap at the head of the screw/nail;

= 0,004 W/K for anchors with a galvanized carbon steel screw/nail with the head covered by at least 15 mm plastic material, or with a minimum 15 mm air gap at the head of the screw/nail;

= 0,008 W/K for all other anchors (worst case);

$U$ : thermal transmittance of the current part of the covered wall (excluding thermal bridges) (W/ (m<sup>2</sup>·K)) determined as follows:

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

where:

$R_{insulation}$ : thermal resistance of the insulation product (according to declaration in reference to EN 13163) in (m<sup>2</sup>·K)/W

$R_{render}$ : thermal resistance of the render (about 0,02 in (m<sup>2</sup>·K)/W or determined by test according to EN 12667 or EN 12664)

$R_{substrate}$ : thermal resistance of the substrate wall in (m<sup>2</sup>·K)/W

$R_{se}$ : external surface thermal resistance in (m<sup>2</sup>·K)/W

$R_{si}$ : internal surface thermal resistance in (m<sup>2</sup>·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.

### 3.5.2. Thermal resistance of the thermal insulation product (EAD 040083-00-0404: clause 2.2.23.1)

See Annex No 1.

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

In accordance with the European Assessment Document EAD No. 040083-00-0404, the applicable European legal act is: Decision 97/556/EC. The system(s) of assessment and verification of constancy of performance (AVCP) is 2+.

In addition, with regard to reaction to fire for products, the applicable European legal act is Decision 97/556/EC, as amended by Decision 2001/596/EC. The system of assessment and verification of constancy of performance (AVCP) is 2+.

**5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD**

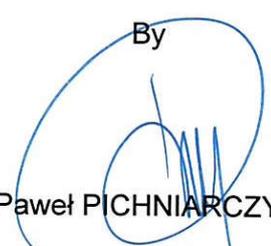
The manufacturer shall perform a permanent internal factory production control based on the Control Plan.

The Control Plan for the manufacturer is specified in clause 3.2 of EAD 040083-00-0404 *External Thermal Insulation Composite Systems (ETICS) with renderings*.

The manufacturer and Łukasiewicz Research Network – Institute of Ceramics and Building Materials TAB have agreed a Control Plan which is deposited at Łukasiewicz Research Network – Institute of Ceramics and Building Materials TAB in documentation which accompanies ETA.

Issued in Krakow on 30.04.2021

By



Paweł PICHNIARCZYK

Director of Łukasiewicz Research Network – Institute of Ceramics and Building Materials

**Annexes:**

Annex No 1 – Insulation product characteristics

Annex No 2 – Glass fibre meshes characteristics

Annex No 3 – Alternative trade names

**Annex No 1 – Insulation product characteristics**

		<b>Boards of expanded polystyrene EPS</b>
Reaction to fire / EN 13501-1		Euroclass – E max. density: 14,5 kg/m <sup>3</sup>
Thermal conductivity ( $\lambda_D$ ) / EN 12667 / EN 12939		$\leq 0,045$ W/(m · K)
Thermal resistance		Defined in the CE marking in reference to EN 13163 (m <sup>2</sup> ·K)/W
Thickness / EN 823		$\pm 2$ mm [EN 13163 - T(2)]
Length / EN 822		$\pm 2$ mm [EN 13163 - L(2)]
Width / EN 822		$\pm 2$ mm [EN 13163 - W(2)]
Squareness / EN 824		$\pm 5$ mm/m [EN 13163 - S(5)]
Flatness / EN 825		5 mm [EN 13163 - P(5)]
Dimensional stability under specified conditions	EN 1603	$\pm 0,2$ % [EN 13163 - DS(N)2]
	EN 1604	2 % [EN 13163 - DS(70,-)2]
Bending strength / EN 12089		$\geq 75$ kPa [EN 13163 – BS75]
Water absorption acc. to EN 1609/Method A		$\leq 1,0$ kg/m <sup>2</sup>
Water vapour permeability, diffusion factor ( $\mu$ ) / EN 12086 - EN 13163		20 to 40
Tensile strength perpendicular to the faces in dry conditions / EN 1607		$\geq 80$ kPa [EN 13163 - TR80]
Shear strength / EN 12090 - EN 13163		$\geq 20$ kPa
Shear modulus / EN 12090 - EN 13163		$\geq 1000$ kPa

**Annex No 2 – Glass fibre meshes characteristics**

Mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
AKE 145	Mass per unit area: 145 g/m <sup>2</sup> Mesh size: 4,0 x 4,5 mm	≥ 20	≥ 50
AKE 170	Mass per unit area: 168 g/m <sup>2</sup> Mesh size: 3,5 x 3,8 mm	≥ 20	≥ 50
E107K	Mass per unit area: 136 g/m <sup>2</sup> Mesh size: 4,5 x 5,3 mm	≥ 20	≥ 50
E121L	Mass per unit area: 135 g/m <sup>2</sup> Mesh size: 3,8 x 4,6 mm	≥ 20	≥ 50
E118L	Mass per unit area: 145 g/m <sup>2</sup> Mesh size: 4,7 x 4,0 mm	≥ 20	≥ 50
E132L	Mass per unit area: 163 g/m <sup>2</sup> Mesh size: 3,9 x 3,8 mm	≥ 20	≥ 50
STAINER 145	Mass per unit area: 145 g/m <sup>2</sup> Mesh size: 4,7 x 4,0 mm	≥ 20	≥ 50
STAINER 160	Mass per unit area: 163 g/m <sup>2</sup> Mesh size: 3,9 x 3,8 mm	≥ 20	≥ 50

**Annex No 2 – Glass fibre meshes characteristics cont.**

Mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
FF 145*	Mass per unit area: 149 g/m <sup>2</sup> Mesh size: 3,5 x 4,9 mm	≥ 20	≥ 50
FF 145**	Mass per unit area: 149 g/m <sup>2</sup> Mesh size: 3,5 x 4,8 mm	≥ 20	≥ 50
FF 150*	Mass per unit area: 148 g/m <sup>2</sup> Mesh size: 4,4 x 3,9 mm	≥ 20	≥ 50
FF 145**	Mass per unit area: 149 g/m <sup>2</sup> Mesh size: 3,5 x 4,9 mm	≥ 20	≥ 50
CE 1	Mass per unit area: 138 g/m <sup>2</sup> Mesh size: 5,0 x 3,6 mm	≥ 20	≥ 50
CE 2	Mass per unit area: 145 g/m <sup>2</sup> Mesh size: 4,6 x 3,6 mm	≥ 20	≥ 50
CE 3	Mass per unit area: 156 g/m <sup>2</sup> Mesh size: 4,0 x 3,7 mm	≥ 20	≥ 50
CE 4	Mass per unit area: 203 g/m <sup>2</sup> Mesh size: 5,9 x 5,5 mm	≥ 20	≥ 50

**Annex No 2 – Glass fibre meshes characteristics cont.**

Mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
CE 6	Mass per unit area: 117 g/m <sup>2</sup> Mesh size: 8,3 x 9,0 mm	≥ 20	≥ 50
CE 7	Mass per unit area: 153 g/m <sup>2</sup> Mesh size: 4,6 x 3,6 mm	≥ 20	≥ 50
CE 8	Mass per unit area: 161 g/m <sup>2</sup> Mesh size: 4,2 x 3,5 mm	≥ 20	≥ 50
CE 10	Mass per unit area: 140 g/m <sup>2</sup> Mesh size: 4,7 x 3,6 mm	≥ 20	≥ 50
CE 11	Mass per unit area: 144 g/m <sup>2</sup> Mesh size: 4,5 x 3,4 mm	≥ 20	≥ 50
CE 1/110	Mass per unit area: 138 g/m <sup>2</sup> Mesh size: 5,0 x 3,6 mm	≥ 20	≥ 50
CE 2/110	Mass per unit area: 145 g/m <sup>2</sup> Mesh size: 4,6 x 3,6 mm	≥ 20	≥ 50
CE 3/110	Mass per unit area: 156 g/m <sup>2</sup> Mesh size: 4,0 x 3,7 mm	≥ 20	≥ 50

**Annex No 2 – Glass fibre meshes characteristics cont.**

Mesh trade name	Description	Alkalis resistance	
		Residual resistance after ageing (N/mm)	Relative residual resistance: % (after ageing) of the strength in the as delivered state
CE 4/110	Mass per unit area: 203 g/m <sup>2</sup> Mesh size: 5,9 x 5,5 mm	≥ 20	≥ 50
CE 6/110	Mass per unit area: 117 g/m <sup>2</sup> Mesh size: 8,3 x 9,0 mm	≥ 20	≥ 50
CE 7/110	Mass per unit area: 153 g/m <sup>2</sup> Mesh size: 4,6 x 3,6 mm	≥ 20	≥ 50
CE 8/110	Mass per unit area: 161 g/m <sup>2</sup> Mesh size: 4,2 x 3,5 mm	≥ 20	≥ 50
CE 10/110	Mass per unit area: 140 g/m <sup>2</sup> Mesh size: 4,7 x 3,6 mm	≥ 20	≥ 50
CE 11/110	Mass per unit area: 144 g/m <sup>2</sup> Mesh size: 4,5 x 3,4 mm	≥ 20	≥ 50

\*plant Slovakia; \*\* plant Macedonia

**Annex No 3 – Alternative trade names**

<b>System trade names</b>	<b>Alternative trade name for components</b>					
STAINER STS	<b>Silicone finishing coat</b>	<b>Acrylic finishing coat</b>	<b>Key coats</b>		<b>Adhesive</b>	
	STAINER SP / STAINER REGEN	STAINER AP	STAINER SG	STAINER AG	STAINER U	STAINER S
Holder	HS	HA	GS	GA	Unimix	Styremix
Farbenfroh	Silko	Acryl	Primer S	Primer A	Super U	Super S
Steiban	Siltech	Akryltech	Gruntech S	Gruntech A	K1	K2
Technico	Siltico	Akryltico	Gruntico S	Gruntico A	Techni U	Techni S
Norde	Norsil	Norac	Grundsil	Grundac	Unistyr	Styreno
Thermoline	Thersil	Therac	Thergrunsil	Thergrunac	UX-1	SX-2