European Technical Assessment

Łukasiewicz
Institute
of Ceramics
and Building
Materials

Łukasiewicz
Instytut Ceramiki
i Materiałów
Budowlanych

31-983 Kraków,
POLAND
Cementowa Str. 8
Tel.: +48 12 683 79 00
jot@icimb.lukasiewicz.gov.pl
www.icimb.lukasiewicz.gov.pl

Member of EOTA
www.eota.eu

European Technical Assessment

ETA-16/0166 of 29/09/2022

General Part

Technical Assessment Body issuing the European Technical Assessment: Łukasiewicz Research Network – Institute of Ceramics and Building Materials	
Trade name of the construction product	TYTAN ETICS MW
Product family to which the construction product belongs	04: External Thermal Insulation Composite Systems (ETICS) with renderings
Manufacturer	SELENA FM S.A. Legnicka 48A 54-202 Wrocław, POLAND *www.selena.com*
Manufacturing plants	Plant 1, Plant 2, Plant 3, Plant 4
This European Technical Assessment contains	43 pages including 5 Annexes which form an integral part of this assessment. Annex No 6 Control Plan and No 7 Identification of manufacturing plants contain confidential information and are not included in the European Technical Assessment when that assessment is publicly disseminated.
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 040083-00-0404 ed. January 2019 – External Thermal Insulation Composite Systems (ETICS) with renderings
This European Technical Assessment replaces	ETA-16/0166, version 2, issued on 04/04/2018

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Specific part

1. Technical description of the product

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

The ETICS kit comprises a prefabricated insulation product of mineral wool (MW) to be bonded or mechanically fixed onto a wall. The 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^2)	Thickness (mm)
	Bonded ETICS: fully or partially bonded, bonded surface area not less than 40%. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	• **Insulation product:** Mineral wool (MW) lamella according to EN 13162 *Product characteristics - see Annex No 1*	-	60 to 300
	• **Adhesives:**		
	- **Tytan IS 12** cement based powder requiring addition of 0,20-0,22 l/kg of water	3,5 to 4,5 (powder)	-
	- **Tytan IS 22** cement based powder requiring addition of 0,21-0,23 l/kg of water	3,5 to 5,5 (powder)	-
	- **Tytan IS 23** cement based powder requiring addition of 0,21-0,23 l/kg of water	3,5 to 5,5 (powder)	-

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
	Mechanically fixed ETICS; mechanically fixed with supplementary adhesive. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	• **Insulation product:** Mineral wool (MW) standard boards according to EN 13162 *Product characteristics - see Annex No 1*	-	60 to 300
	• **Anchors** *Products characteristics - see Annex No 2*	-	-
	• **Supplementary adhesives:**		
	- **Tytan IS 12** cement based powder requiring addition of 0,20-0,22 l/kg of water	3,5 to 4,5 (powder)	-
	- **Tytan IS 22** cement based powder requiring addition of 0,21-0,23 l/kg of water	3,5 to 5,5 (powder)	-
	- **Tytan IS 23** cement based powder requiring addition of 0,21-0,23 l/kg of water	3,5 to 5,5 (powder)	-
Base coats	• **Tytan IS 22** cement based powder requiring addition of 0,21-0,23 l/kg of water	4,0 to 5,5 (powder)	3,0 to 5,0
	• **Tytan IS 23** cement based powder requiring addition of 0,21-0,23 l/kg of water	4,0 to 5,5 (powder)	3,0 to 5,0
Reinforce-ment	• **Standard glass fibre meshes:**		
	- 122 plan Macedonia	-	-
	- TYTAN IS 165	-	-
	- SSA-1363-160	-	-
	- TYTAN IS 165 A	-	-
	- 122 plant Slovakia	-	-
	Products characteristics - see Annex No 4		

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Key coat	• **Tytan IS 41** ready to use liquid to be used with all finishing coats	0,2 to 0,3	-
Finishing coats	• **Mineral finishing coat.** Dry cement based powder requiring addition of 0,21-0,22 l/kg of water		
	Tytan IS 54 floated structure max. particles size:	1,8 to 4,2 (powder)	
	0,5 mm		1,5
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	ribbed structure max. particles size:	2,2 to 4,2 (powder)	
	2,0 mm		2,0
	2,5 mm		2,5
	• **Acrylic finishing coats.** Ready to use pastes – acrylic binder:		
	Tytan IS 51 floated structure max. particles size:	1,8 to 4,2	
	0,5 mm		1,5
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	ribbed structure max. particles size:	2,0 to 4,2	
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	Tytan IS 51N (spray application) floated structure max. particles size:	1,8 to 4,2	
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	**Tytan IS 56** mosaic structure fine-grained max. particles size: 1,0; 1,5 mm	1,8 to 5,0	Regulated by particles size
	Tytan IS 56N (spray application) mosaic structure fine-grained max. particles size:	2,2 to 5,0	
	1,0 mm		1,0
	1,5 mm		1,5
	• **Hybrid finishing coats.** Ready to use pastes – silicone-silicate-acrylic binder:		
	Tytan IS 55 floated structure max. particles size:	1,8 to 4,2	
	0,5 mm		1,5
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	ribbed structure max. particles size:	2,0 to 4,2	
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	Tytan IS 55N (spray application) floated structure max. particles size:	1,8 to 4,2	
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• **Sol-silica finishing coats.** Ready to use pastes – siliceous-acrylic binder:		
	Tytan IS 52		
	floated structure	1,8 to 4,2	
	max. particles size:		
	0,5 mm		1,5
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	ribbed structure	2,0 to 4,2	
	max. particles size:		
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	Tytan IS 52N (spray application)		
	floated structure		
	max. particles size:	1,8 to 4,2	
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	• **Silicone finishing coats.** Ready to use pastes – silicone-acrylic binder:		
	Tytan IS 53		
	floated structure		
	max. particles size:	1,8 to 4,2	
	0,5 mm		1,5
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	ribbed structure		
	max. particles size:	2,0 to 4,2	
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5
	Tytan IS 53N (spray application)		
	faktura floated		
	maksymalne uziarnienie:	1,8 to 4,2	
	1,0 mm		1,5
	1,5 mm		1,5
	2,0 mm		2,0
	2,5 mm		2,5

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Decorative coats (paints)	• **Farba elewacyjna silikonowa Tytan IS 73** ready to use pigmented liquid to be used optionally with all finishing coats except Tytan IS 56 and Tytan IS 56N	0,2 to 0,3	-
	• **Farba elewacyjna silikatowa Tytan IS 74** ready to use pigmented liquid to be used obligatory with mineral finishing coats	0,2 to 0,3	-
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 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 TYTAN ETICS MW 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 ÷ 5. 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	Class acc. to EN 13501-1
Adhesive	0,41	No flame retardant	A2-s2, d0
MW boards *density ≤ 120,0 kg/m³*	-		
Base coat	0,41		
Glass fibre mesh	9,48		
Key coat	6,29		
Finishing coat	2,34		
Decorative coat	3,95		

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 Tytan IS 22 on MW board:
  - Water absorption after 1 hour = 0,03 kg/m^2;
  - Water absorption after 24 hours = 0,14 kg/m^2.
- Base coat Tytan IS 22 on MW lamella:
  - Water absorption after 1 hour = 0,16 kg/m^2;
  - Water absorption after 24 hours = 0,41 kg/m^2.
- Base coat Tytan IS 23 on MW board:
  - Water absorption after 1 hour = 0,03 kg/m^2;
  - Water absorption after 24 hours = 0,14 kg/m^2.
- Base coat Tytan IS 23 on MW lamella:
  - Water absorption after 1 hour = 0,16 kg/m^2;
  - Water absorption after 24 hours = 0,41 kg/m^2.

- Rendering systems: Table 3.

Table 3.

		Water absorption after 1 hour	Water absorption after 24 hours
		mean value (kg/m²)	
MW board acc. to Annex No 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54 + Farba elewacyjna silikatowa Tytan IS 74	0,30	0,45
	Tytan IS 51	0,05	0,25
	Tytan IS 51N	0,05	0,25
	Tytan IS 56	0,14	0,48
	Tytan IS 56N	0,14	0,48
	Tytan IS 55	0,16	0,44
	Tytan IS 55N	0,16	0,44
	Tytan IS 52	0,05	0,26
	Tytan IS 52N	0,05	0,26
	Tytan IS 53	0,04	0,20
	Tytan IS 53N	0,04	0,20

Table 3. cont.

		Water absorption after 1 hour	Water absorption after 24 hours
		mean value (kg/m²)	
MW lamella acc. to Annex No 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54 + Farba elewacyjna silikatowa Tytan IS 74	0,27	0,41
	Tytan IS 51	0,12	0,40
	Tytan IS 51N	0,12	0,40
	Tytan IS 56	0,08	0,28
	Tytan IS 56N	0,08	0,28
	Tytan IS 55	0,11	0,39
	Tytan IS 55N	0,11	0,39
	Tytan IS 52	0,15	0,39
	Tytan IS 52N	0,15	0,39
	Tytan IS 53	0,07	0,32
	Tytan IS 53N	0,07	0,32

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 occured 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^2 (Tab. 3).

The ETICS is so assessed as freeze-thaw resistant.

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 TYTAN IS 165		Impact diameter (mm) / damages		
MW board acc. to Annex No 1				
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54, floated 1,5 mm + Farba elewacyjna silikatowa Tytan IS 74	9 / superficial damages without cracks formation	32 / cracks without reaching the insulation product	II
	Tytan IS 51, ribbed 1,5 mm	11 / superficial damages without cracks formation	33 / cracks without reaching the insulation product	II
	Tytan IS 51N, ribbed 1,5 mm	11 / superficial damages without cracks formation	33 / cracks without reaching the insulation product	II
	Tytan IS 56, 1,0 mm	13 / superficial damages without cracks formation	29 / cracks without reaching the insulation product	II
	Tytan IS 56N, 1,0 mm	13 / superficial damages without cracks formation	29 / cracks without reaching the insulation product	II
	Tytan IS 55, ribbed 1,5 mm	11 / superficial damages without cracks formation	29 / cracks without reaching the insulation product	II
	Tytan IS 55N, ribbed 1,5 mm	11 / superficial damages without cracks formation	29 / cracks without reaching the insulation product	II

Table 4. cont.

		Hard body impact		
		Impact energy 3 J	Impact energy 10 J	Impact resistance category
Single layer of standard mesh TYTAN IS 165		Impact diameter (mm) / damages		
MW lamella acc. to Annex No 1				
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter:	Tytan IS 51, ribbed 1,5 mm	12 / superficial damages without cracks formation	35 / cracks without reaching the insulation product	II
	Tytan IS 51N, ribbed 1,5 mm	12 / superficial damages without cracks formation	35 / cracks without reaching the insulation product	II
	Tytan IS 55, ribbed 1,5 mm	15 / superficial damages without cracks formation	31 / cracks without reaching the insulation product	II
	Tytan IS 55N, ribbed 1,5 mm	15 / superficial damages without cracks formation	31 / cracks without reaching the insulation product	II
	Tytan IS 52, ribbed 1,5 mm	13 / superficial damages without cracks formation	31 / cracks without reaching the insulation product	II
	Tytan IS 52N, ribbed 1,5 mm	13 / superficial damages without cracks formation	31 / cracks without reaching the insulation product	II
	Tytan IS 53, ribbed 1,5 mm	14 / superficial damages without cracks formation	33 / cracks without reaching the insulation product	II
	Tytan IS 53N, ribbed 1,5 mm	14 / superficial damages without cracks formation	33 / cracks without reaching the 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
Single layer of standard mesh TYTAN IS 165		**Impact diameter (mm) / damages**		
MW board acc. to Annex No 1				
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter:	Tytan IS 52, ribbed 1,5 mm	0 / no damages	36 / cracks without reaching the insulation product	II
	Tytan IS 52N, ribbed 1,5 mm	0 / no damages	36 / cracks without reaching the insulation product	II
	Tytan IS 53, ribbed 1,5 mm	0 / no damages	16 / superficial damages without cracks formation	I
	Tytan IS 53N, ribbed 1,5 mm	0 / no damages	16 / superficial damages without cracks formation	I
MW lamella acc. to Annex No 1				
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54, floated 1,5 mm + Farba elewacyjna silikatowa Tytan IS 74	0 / no damages	14 / superficial damages without cracks formation	I
	Tytan IS 56, 1,0 mm	0 / no damages	0 / no damages	I
	Tytan IS 56N, 1,0 mm	0 / no damages	0 / no damages	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 6.

		Equivalent air thickness s_d (m)
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 + Farba elewacyjna silikatowa Tytan IS 74 *thickness of rendering: 7,7 mm*	0,15 0,12
	Tytan IS 51, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,18
	Tytan IS 51N, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,18
	Tytan IS 56*, 1,5 mm *thickness of rendering: 6,5 mm*	0,22
	Tytan IS 56N*, 1,5 mm *thickness of rendering: 6,5 mm*	0,22
	Tytan IS 55, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,22
	Tytan IS 55N, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,22
	Tytan IS 52, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,21
	Tytan IS 52N, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,21
	Tytan IS 53, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,18
	Tytan IS 53N, floated 2,5 mm + Farba elewacyjna silikonowa Tytan IS 73 *thickness of rendering: 7,7 mm*	0,18

*decorative coat not used

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 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 7.

		Bond strength (kPa)	
		mean	min.
MW board acc. to Annex No 1			
Tytan IS 22	initial state	12*	10
	hygrothermal cycles (from the rig)	11*	10
	freeze-thaw cycles	test not required	
Tytan IS 23	initial state	12*	10
	hygrothermal cycles (from the rig)	11*	10
	freeze-thaw cycles	test not required	
MW lamella acc. to Annex No 1			
Tytan IS 22	initial state	80*	80
	hygrothermal cycles (from the rig)	61*	56
	freeze-thaw cycles	test not required	
Tytan IS 23	initial state	80*	80
	hygrothermal cycles (from the rig)	61*	56
	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 8.

		Bond strength (kPa)	
		mean	min.
Tytan IS 12**	initial state	406*	375
	48 h immersion in water + 2 hours 23°C/50% RH	425*	331
	48 h immersion in water + 7 days 23°C/50% RH	529*	420
Tytan IS 22**	initial state	493*	429
	48 h immersion in water + 2 hours 23°C/50% RH	374*	320
	48 h immersion in water + 7 days 23°C/50% RH	823*	652
Tytan IS 23**	initial state	493*	429
	48 h immersion in water + 2 hours 23°C/50% RH	374*	320
	48 h immersion in water + 7 days 23°C/50% RH	823*	652

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

Minimal bonded surface area: S = 38 %

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

Table 9.

		Bond strength (kPa)	
		mean	min.
Tytan IS 12**	**MW board acc. to Annex No 1**		
	initial state	10	10
	48 h immersion in water + 2 hours 23°C/50% RH	10	9
	48 h immersion in water + 7 days 23°C/50% RH	10	10
	MW lamella acc. to Annex No 1		
	initial state	83*	80
	48 h immersion in water + 2 hours 23°C/50% RH	59*	57
	48 h immersion in water + 7 days 23°C/50% RH	83*	80
Tytan IS 22**	**MW board acc. to Annex No 1**		
	initial state	10	10
	48 h immersion in water + 2 hours 23°C/50% RH	10	8
	48 h immersion in water + 7 days 23°C/50% RH	10	10
	MW lamella acc. to Annex No 1		
	initial state	80*	79
	48 h immersion in water + 2 hours 23°C/50% RH	62*	57
	48 h immersion in water + 7 days 23°C/50% RH	81*	80
Tytan IS 23**	**MW board acc. to Annex No 1**		
	initial state	10	10
	48 h immersion in water + 2 hours 23°C/50% RH	10	9
	48 h immersion in water + 7 days 23°C/50% RH	10	10
	MW lamella acc. to Annex No 1		
	initial state	81*	80
	48 h immersion in water + 2 hours 23°C/50% RH	78*	75
	48 h immersion in water + 7 days 23°C/50% RH	81*	80

*cohesive rupture in insulation; ** thickness of adhesive – about 3 mm

Minimal bonded surface area: S = 38 %

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 · d < 50 000 N/mm.

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

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

Table 10.

Anchors for which the following failure loads apply			**Anchors according to Annex No 2**
		Plate diameter (mm)	≥ 60
Characteristics of the **MW boards** for which the following failure loads apply		Thickness (mm)	≥ 60
		Tensile strength perpendicular to the faces (kPa) under dry conditions under wet conditions 28 days	 ≥ 11 ≥ 9
Failure loads (kN)	Anchors not placed at the panel joints (*Pull-through test*) dry conditions	R_{panel}	Individual values: 0,227; 0,178; 0,223; 0,249; 0,265
			Mean: 0,228
	Anchors not placed at the panel joints (*Pull-through test*) wet conditions	R_{panel}	Individual values: 0,132; 0,162; 0,159; 0,186; 0,165
			Mean: 0,161
	Anchors placed at the panel joints (*Pull-through test*) dry conditions	R_{joint}	Individual values: 0,215; 0,162; 0,201; 0,180; 0,207
			Mean: 0,193
	Anchors placed at the panel joints (*Pull-through test*) wet conditions	R_{joint}	Individual values: 0,116; 0,149; 0,135; 0,141; 0,143
			Mean: 0,137

Load / Displacement Graphs see Annex No 3.

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)

No performance 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/m²)	
		mean	individual values
MW board acc. to Annex 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54 + Farba elewacyjna silikatowa Tytan IS 74	10*	9; 10; 10; 11; 11
	Tytan IS 51	10*	9; 10; 10; 10; 12
	Tytan IS 51N	10*	9; 10; 10; 10; 12
	Tytan IS 56	10*	11; 9; 10; 12; 9
	Tytan IS 56N	10*	11; 9; 10; 12; 9
	Tytan IS 55	10*	11; 10; 10; 11; 10
	Tytan IS 55N	10*	11; 10; 10; 11; 10

*cohesive rupture in insulation

Table 11. cont.

		Bond strength after hygrothermal cycles (kN/m²)	
		mean value	individual values
MW lamella acc. to Annex 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter:	Tytan IS 51	70*	72; 78; 53; 73; 72
	Tytan IS 51N	70*	72; 78; 53; 73; 72
	Tytan IS 55	73*	69; 74; 76; 74; 72
	Tytan IS 55N	73*	69; 74; 76; 74; 72
	Tytan IS 52	72*	73; 73; 70; 72; 74
	Tytan IS 52N	72*	73; 73; 70; 72; 74
	Tytan IS 53	71*	70; 66; 72; 70; 75
	Tytan IS 53N	71*	70; 66; 72; 70; 75

*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/m²)	
		mean value	individual values
MW board acc. to Annex 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter:	Tytan IS 52	11*	12; 12; 10; 11; 10
	Tytan IS 52N	11*	12; 12; 10; 11; 10
	Tytan IS 53	11*	12; 10; 10; 10; 11
	Tytan IS 53N	11*	12; 10; 10; 10; 11
MW lamella acc. to Annex 1			
Rendering system: Base coat: Tytan IS 22 or Tytan IS 23 + key coat + finishing coat indicated hereafter + decorative coat (if used):	Tytan IS 54 + Farba elewacyjna silikatowa Tytan IS 74	83*	80, 81, 83, 86, 84
	Tytan IS 56	84*	80, 88, 86, 82, 83
	Tytan IS 56N	84*	80, 88, 86, 82, 83

*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
122**	47,0	49,0	3,90	3,40
TYTAN IS 165 (EUROWEK LUX)	39,0	55,0	3,70	3,70
SSA-1363-160	43,0	45,0	3,60	3,90
TYTAN IS 165 A (HALICO A165)	43,2	45,1	4,83	4,81
122*	44,0	46,0	3,90	3,50

*plant Slovakia; **plan 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
122**	27,0	36,0	57,4	73,5	2,30	2,50
TYTAN IS 165 (EUROWEK LUX)	28,0	49,0	71,8	89,1	2,60	3,40
SSA-1363-160	26,0	29,0	60,5	64,4	2,30	2,30
TYTAN IS 165 A (HALICO A165)	37,8	37,0	87,5	82,0	3,86	3,56
122*	23,0	29,0	52,3	63,0	2,10	2,10

*plant Slovakia; **plan 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 MW* $[(m^2 \cdot K)/W]$	Thermal resistance R_{ETICS} with maximum thickness of MW* $[(m^2 \cdot K)/W]$
1,135	6,687

*at maximum value of thermal conductivity 0,045 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/(m²·K)

U_c: corrected thermal transmittance of the entire wall (W/ (m²·K))

n: number of anchors (through insulation product) per 1 m²

χ_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/ (m²·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 13162) in (m²·K)/W

R_{render}: thermal resistance of the render (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 wall in (m²·K)/W

R_{se}: external surface thermal resistance in (m²·K)/W

R_{si}: internal surface 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.

3.5.2. 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 reactionto 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 29.09.2022

By

Paweł PICHNIARCZYK

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

Annexes:

Annex No 1 – Insulation products characteristics

Annex No 2 – Anchors characteristics for mechanically fixed ETICS with supplementary adhesive

Annex No 3 – Load-displacement graph

Annex No 4 – Glass fibre meshes characteristics

Annex No 5 – Alternative trade names of TYTAN ETICS MW system components

Annex No 1 – Insulation product characteristics

		Factory made mineral wool (MW) products according to EN 13162	
		MW board	**MW lamella**
Reaction to fire / EN 13501-1		Class A1 max. density: 120 kg/m³	
Thermal conductivity (λ_D) / EN 12667 / EN 12939		≤ 0,045 W/(m · K)	
Thermal resistance		Defined in the CE marking in reference to EN 13162 (m²·K)/W	
Thickness / EN 823		- 1 % or - 1 mm + 3 mm [EN 13162 – T5]	- 3 % or - 3 mm + 5 % or + 5 mm [EN 13162 - T4]
Dimensional stability under specified conditions	EN 1604	1 % [EN 13162 - DS(70,-)]	
	EN 1604	1 % [EN 13162 - DS(70,90)]	
Short-term water absorption (partial immersion) / EN 1609		EN 13162 - WS	
Long-term water absorption (partial immersion) / EN 12087		EN 13162 - WL(P)	
Water vapour diffusion resistance factor (μ) / EN 12086		EN 13162 - 1	
Tensile strength perpendicular to the faces in dry conditions / EN 1607		≥ 10 kPa [EN 13162 – TR10]	≥ 80 kPa [EN 13162 – TR80]
Shear strength / EN 12090		-	≥ 25 kPa
Shear modulus / EN 12090		-	≥ 1000 kPa

Annex No 2 – Anchors characteristics for mechanically fixed ETICS with supplementary adhesive

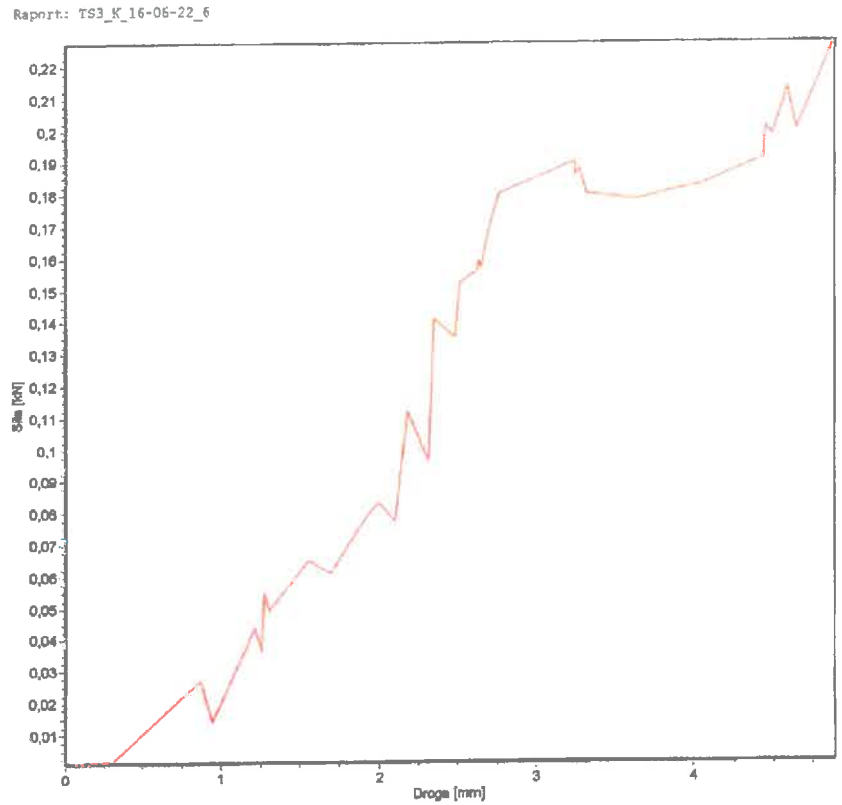
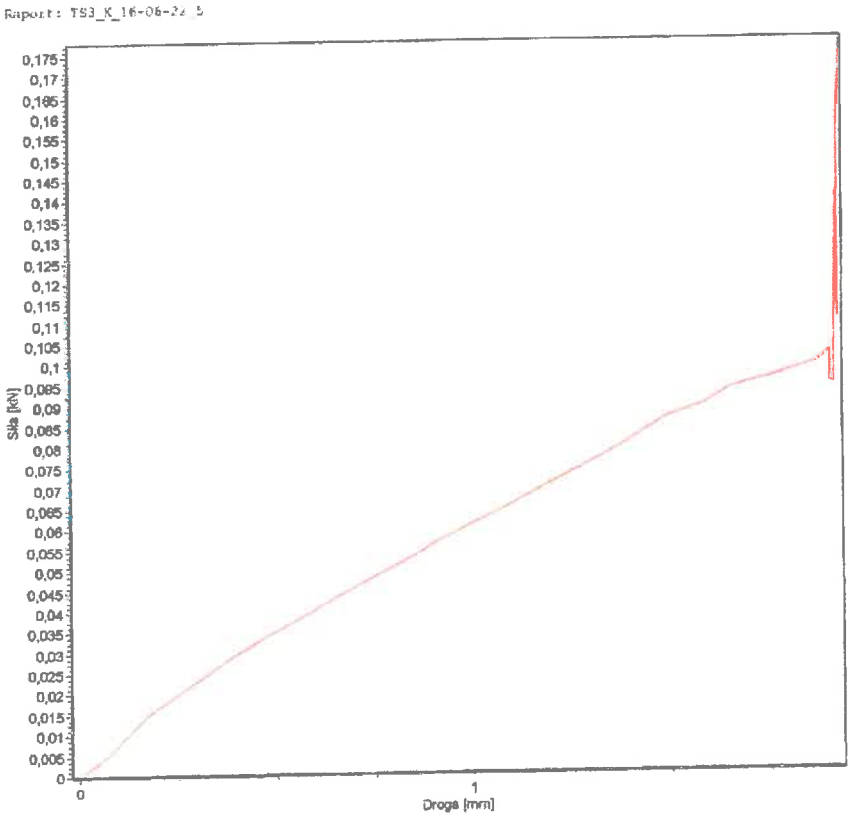
Anchor trade name	Plate stiffness (kN/mm) / diameter (mm)	Characteristic resistance in the substrate
KI-10N	0,5 / 60	ETA 07/0221
KI-10NS	0,5 / 60	
Koelner KI-10M	0,4 / 60	ETA 07/0291
Koelner TFIX-8M	1,0 / 60	ETA 07/0336
Koelner TFIX-8S	0,6 / 60	ETA 11/0144
Koelner TFIX-8ST	0,6 / 60	
EJOT ejotherm STR U	0,6 / 60	ETA 04/0023
EJOT ejotherm NT U	0,6 / 60	ETA 05/0009

Additionally, anchors covered by relevant ETA can be used, provided that they meet the following requirements:

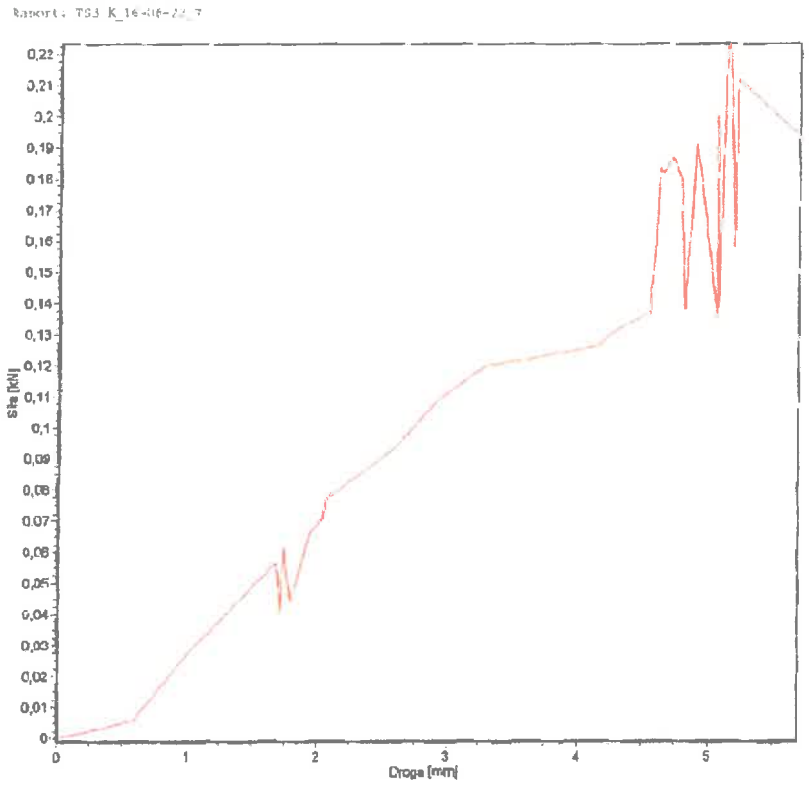
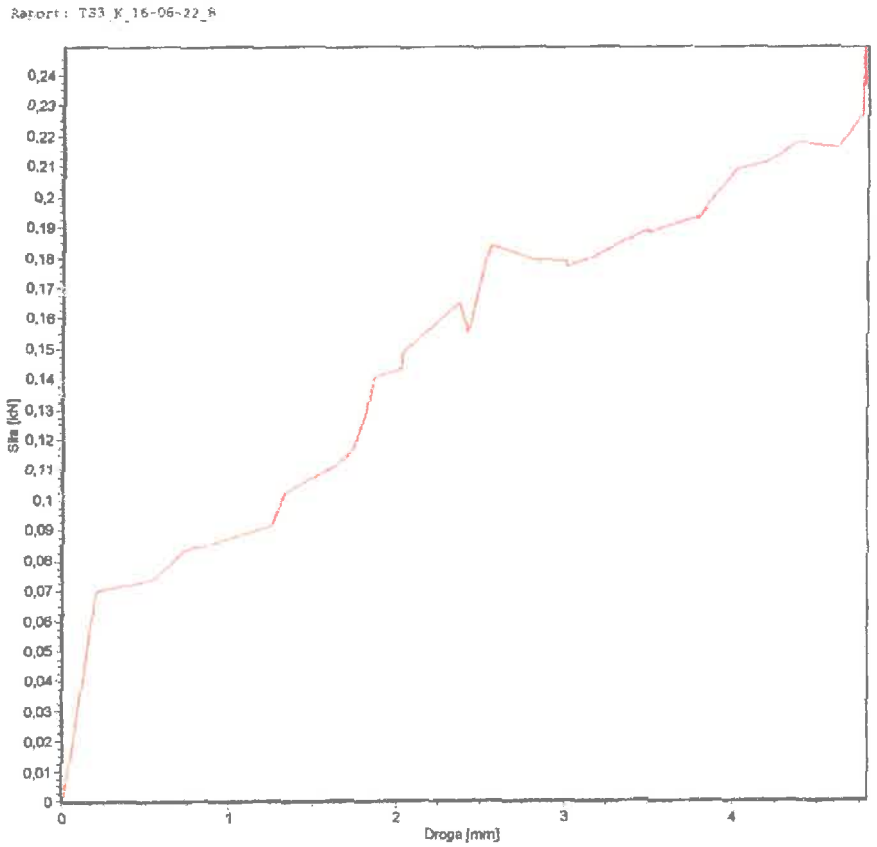
	Requirement*
Plate diameter	≥ 60 mm
Plate stiffness	≥ 0,3 kN/mm

*anchors with pin made of steel shall be used

Annex No 3 – Load-displacement graphs

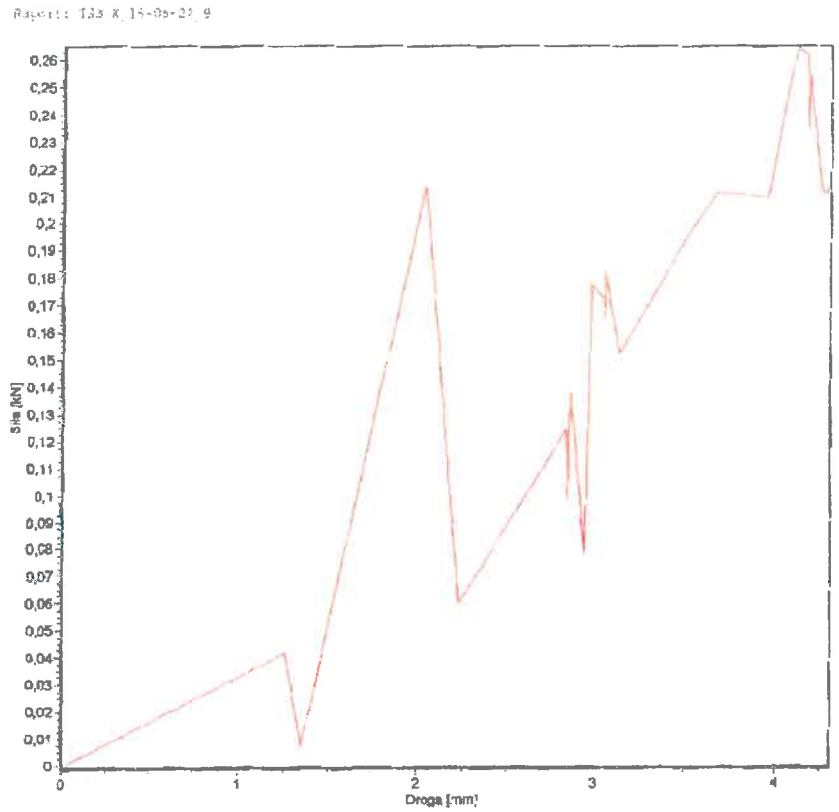
Anchors not placed at the panel joints (*Pull-through test*) dry conditions
Graph 1

Graph 2


Annex No 3 – Load-displacement graphs cont.

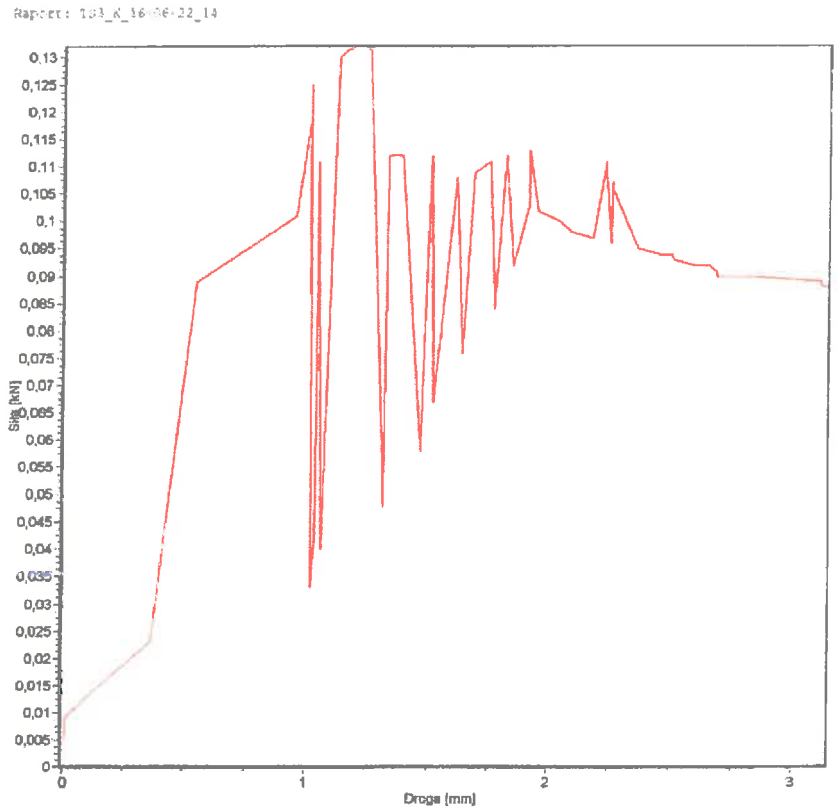
Anchors not placed at the panel joints (*Pull-through test*) dry conditions
Graph 3

Graph 4


Annex No 3 – Load-displacement graphs cont.

Anchors not placed at the panel joints (*Pull-through test*) dry conditions
Graph 5



Annex No 3 – Load-displacement graphs cont.

Anchors not placed at the panel joints (*Pull-through test*) wet conditions
Graph 1

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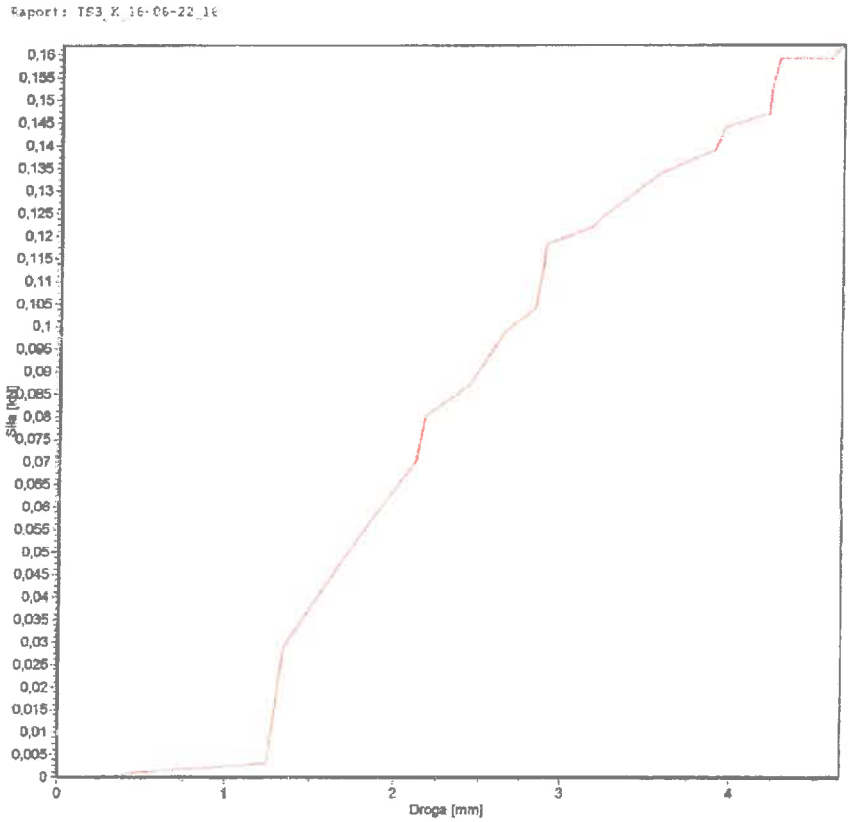
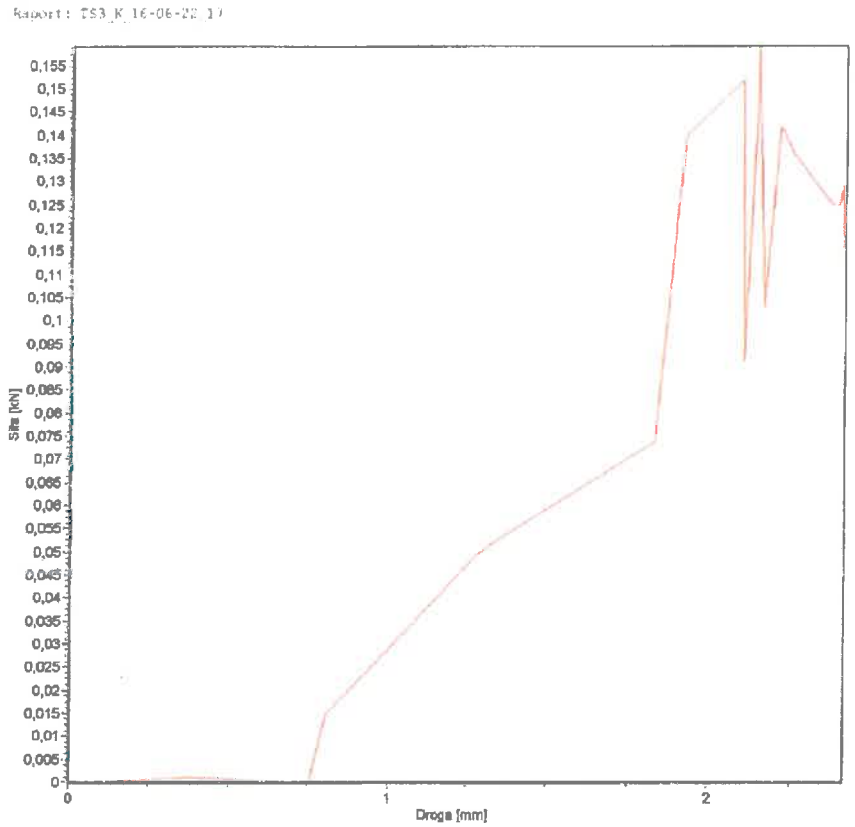


Annex No 3 – Load-displacement graphs cont.

Anchors not placed at the panel joints (*Pull-through test*) wet conditions
Graph 3

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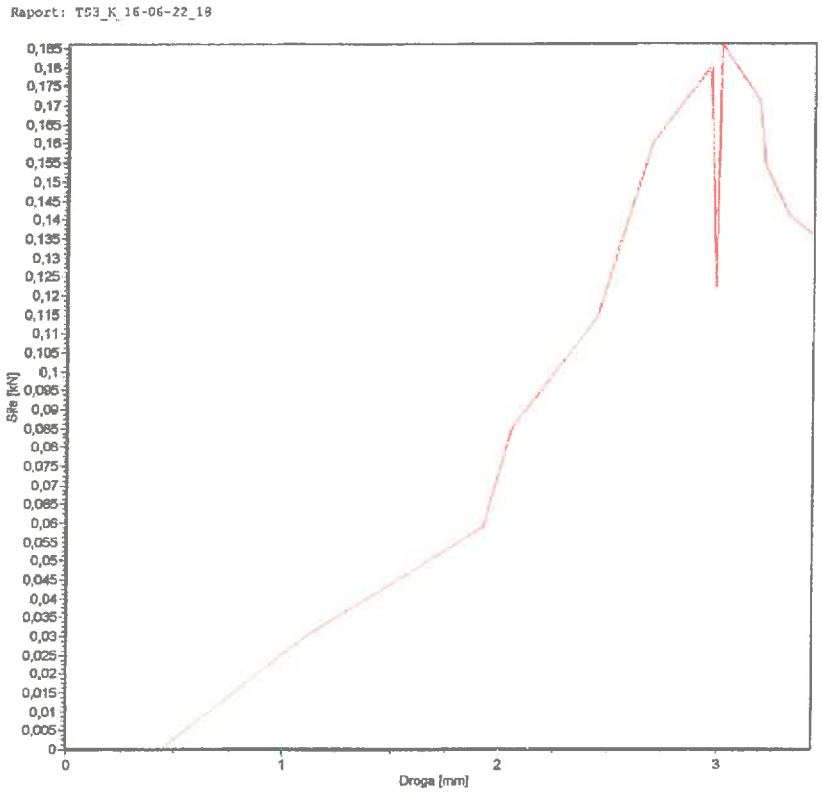
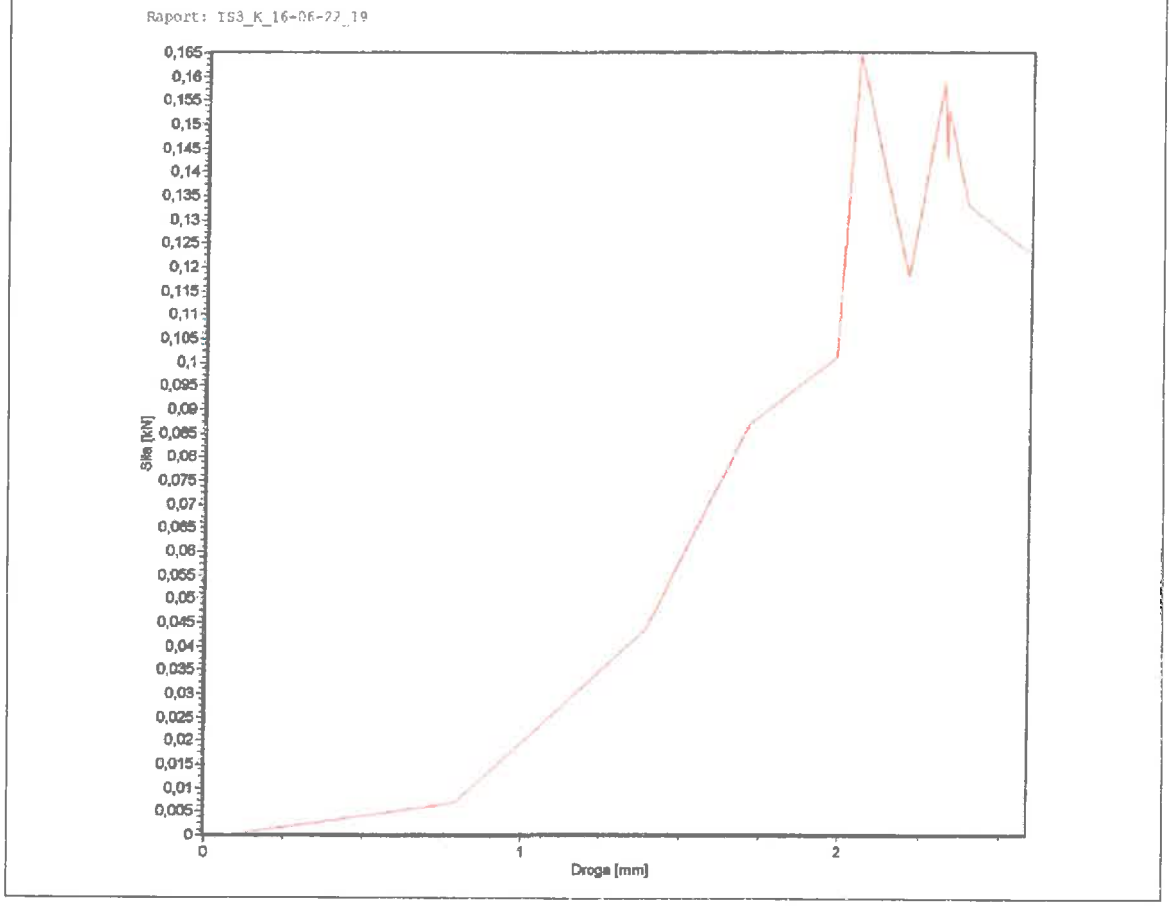
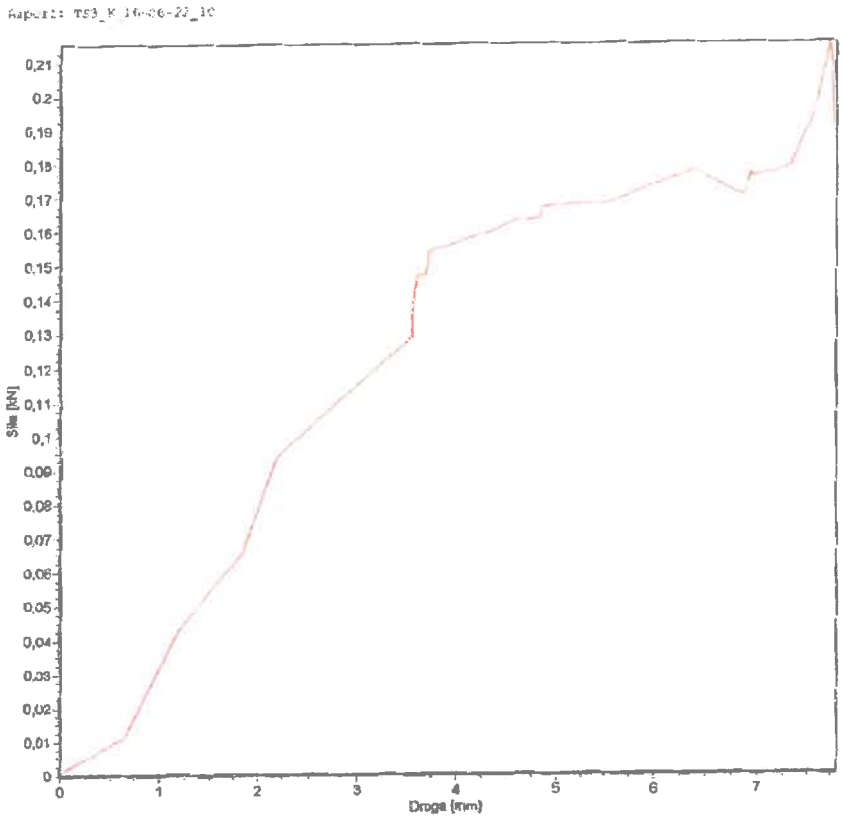


Annex No 3 – Load-displacement graphs cont.

Anchors not placed at the panel joints (*Pull-through test*) wet conditions
Graph 5



Annex No 3 – Load-displacement graphs

Anchors placed at the panel joints (*Pull-through test*) dry conditions
Graph 1

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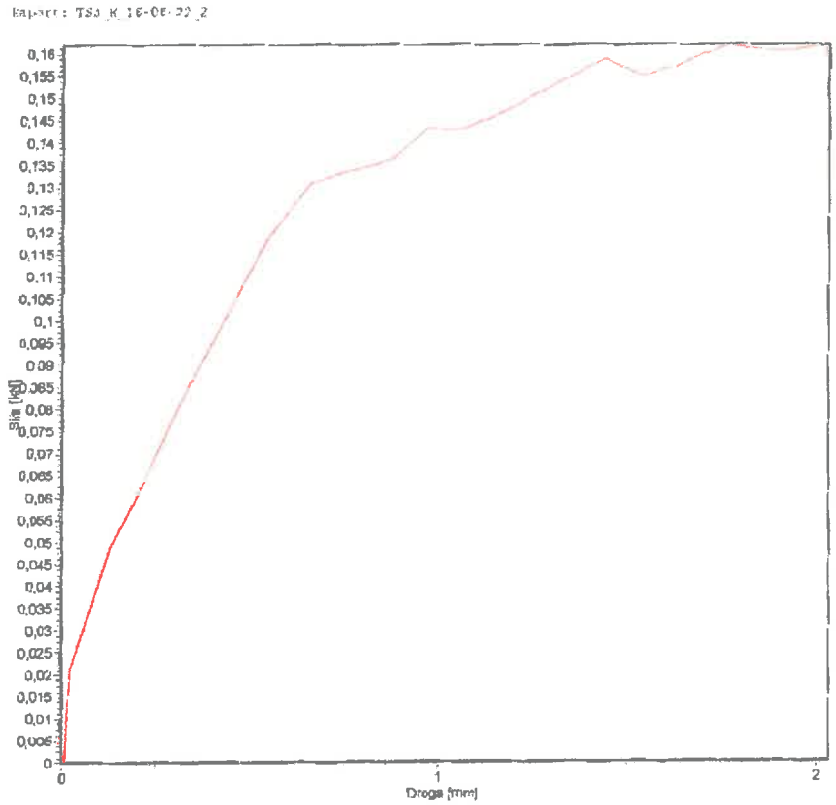
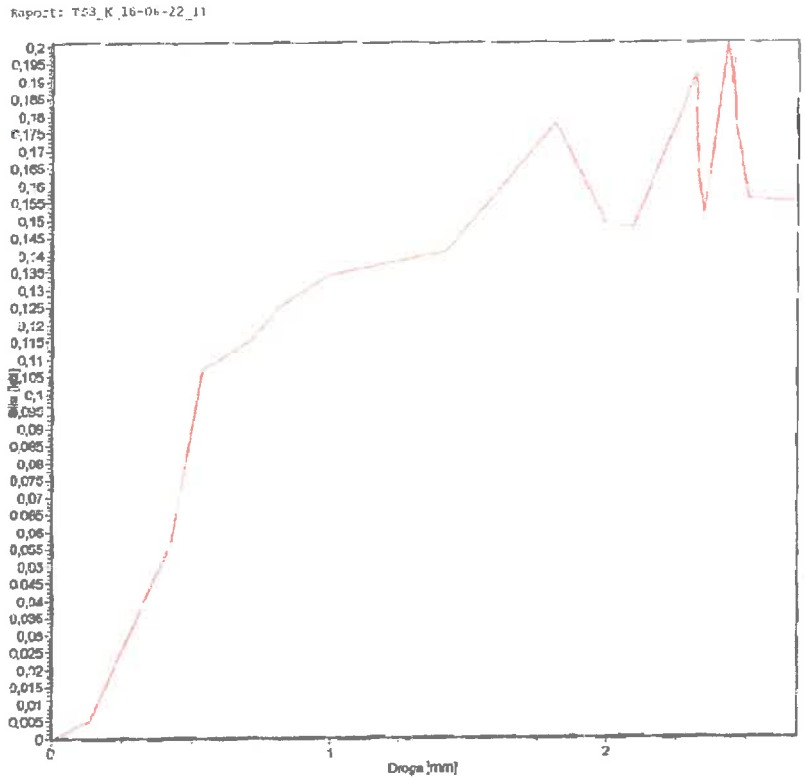


Annex No 3 – Load-displacement graphs cont.

Anchors placed at the panel joints (*Pull-through test*) dry conditions
Graph 3

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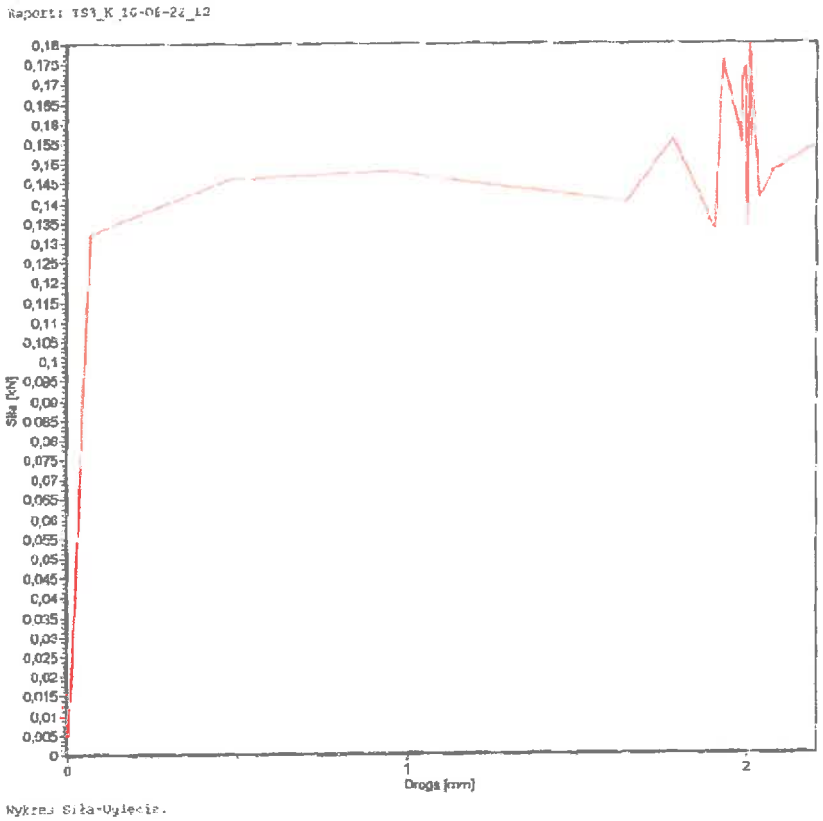
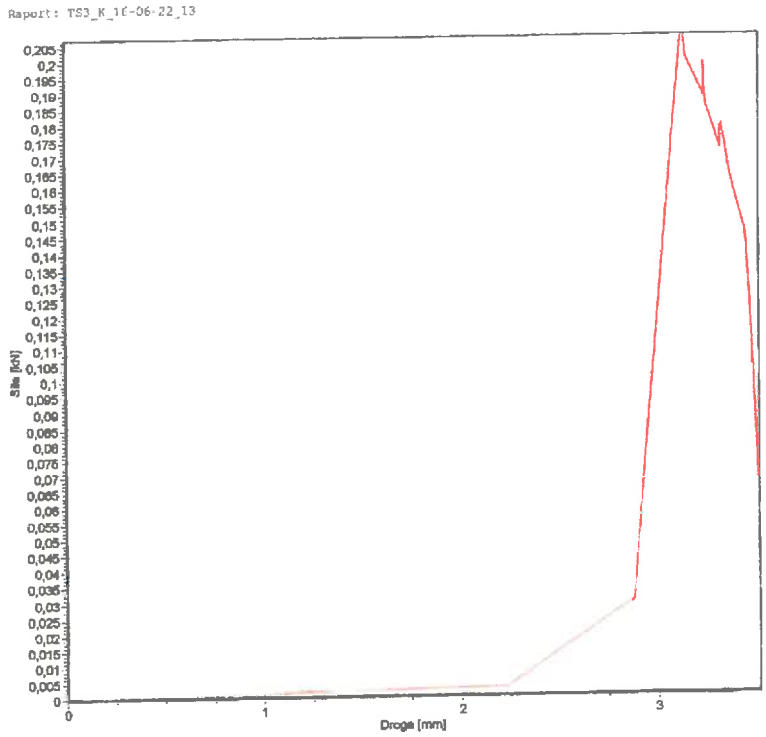
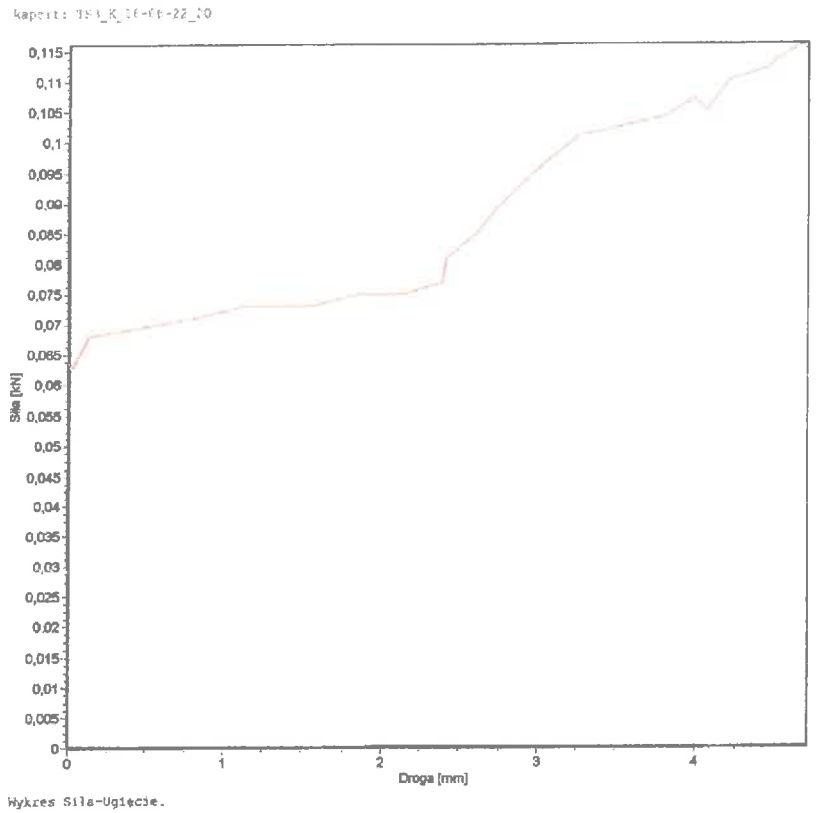
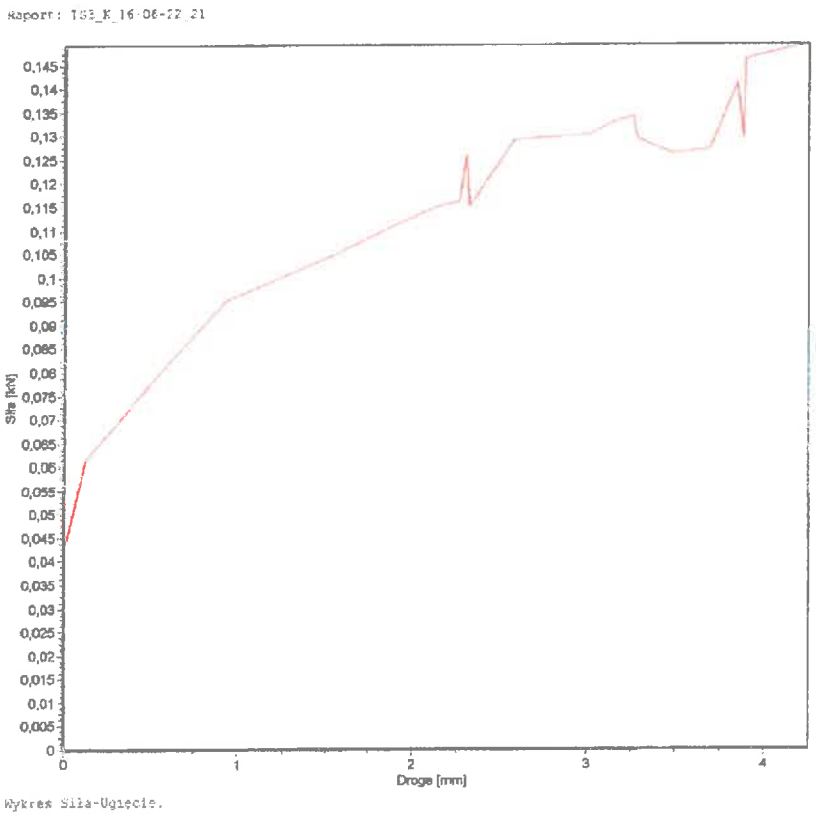


Annex No 3 – Load-displacement graphs cont.

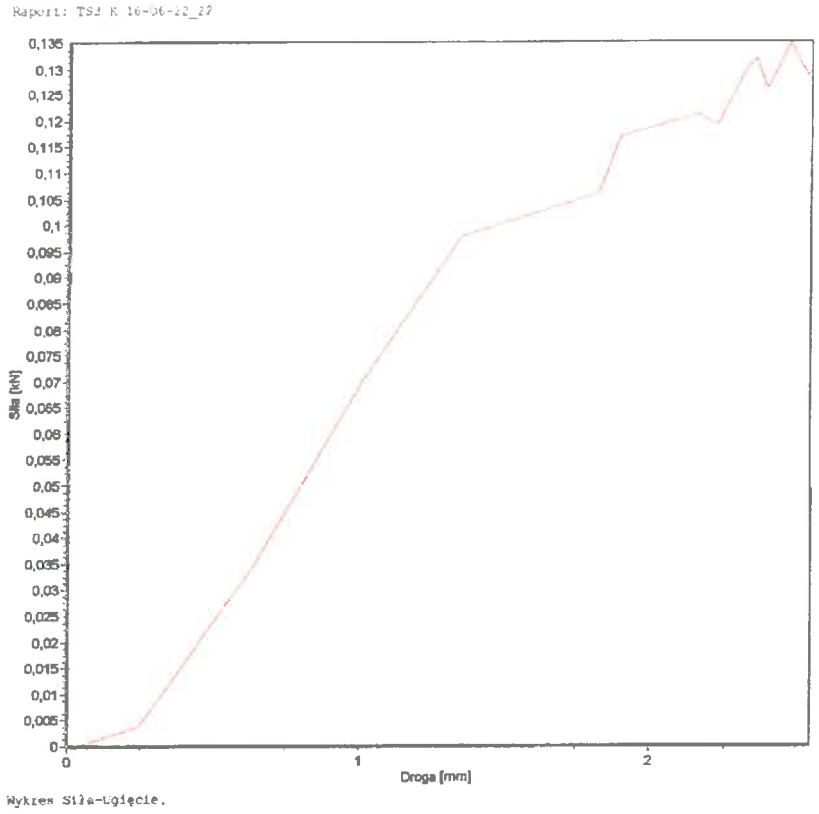
Anchors placed at the panel joints (*Pull-through test*) dry conditions
Graph 5


Annex No 3 – Load-displacement graphs cont.

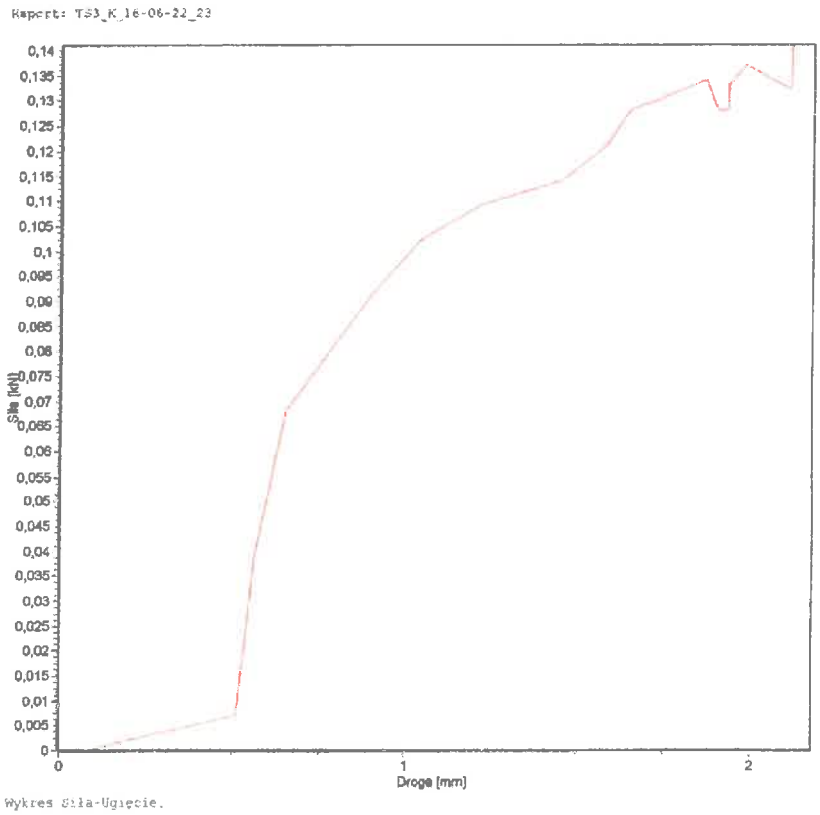
Anchors placed at the panel joints (*Pull-through test*) wet conditions
Graph 1

Graph 2


Annex No 3 – Load-displacement graphs cont.

Anchors placed at the panel joints (*Pull-through test*) wet conditions
Graph 3

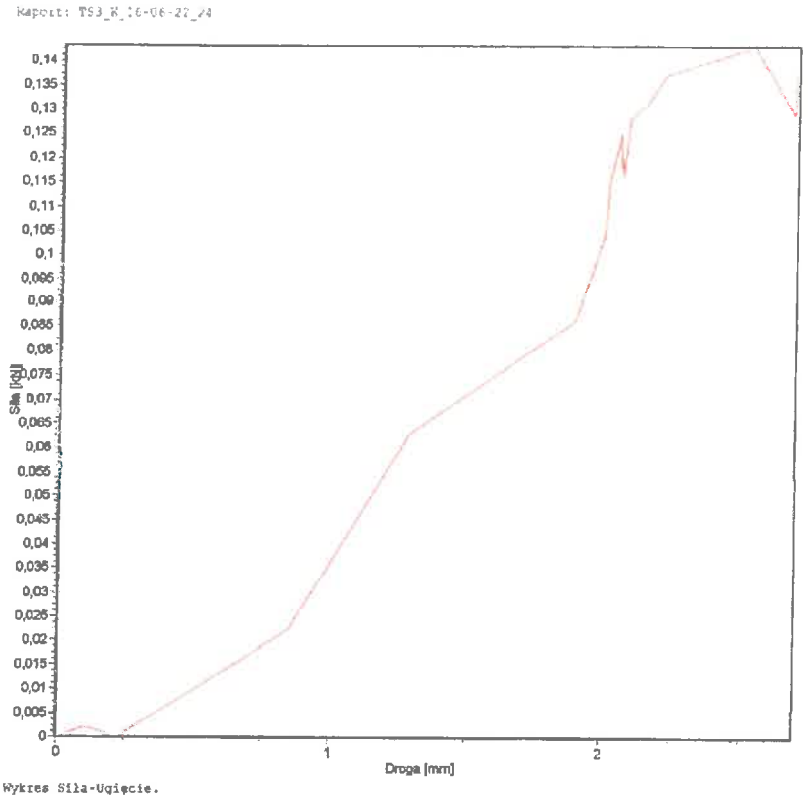


Graph 4



Annex No 3 – Load-displacement graphs cont.

Anchors placed at the panel joints (*Pull-through test*) wet conditions
Graph 5



Annex No 4 – 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
122**	Mass per unit area: 160 g/m^2 Mesh size: 3,5 x 3,9 mm	≥ 20	≥ 50
TYTAN IS 165 (EUROWEK LUX)	Mass per unit area: 163 g/m^2 Mesh size: 4,2 x 4,9 mm	≥ 20	≥ 50
SSA-1363-160	Mass per unit area: 165 g/m^2 Mesh size: 4,0 x 3,9 mm	≥ 20	≥ 50
TYTAN IS 165 A (HALICO A165)	Mass per unit area: 165 g/m^2 Mesh size: 3,7 x 4,4 mm	≥ 20	≥ 50
122*	Mass per unit area: 165 g/m^2 Mesh size: 3,5 x 3,9 mm	≥ 20	≥ 50

*plant Slovakia; **plan Macedonia

Annex No 5 – Alternative trade names of TYTAN ETICS MW system components

	Trade name	Alternative trade name
	ETICS name	
	TYTAN ETICS MW	Quilosa ETICS MW
	Component	
Adhesives	Tytan IS 12	Quilosa Termo pro IS 12
	Tytan IS 22	Quilosa Termo pro IS 22
	Tytan IS 23	Quilosa Termo pro IS 23
Base coats	Tytan IS 21	Quilosa Termo pro IS 21
	Tytan IS 22	Quilosa Termo pro IS 22
	Tytan IS 23	Quilosa Termo pro IS 23
Key coat	Tytan IS 41	Quilosa Termo pro IS 41
Finishing coats	Tytan IS 54	Quilosa Termo pro IS 54
		Tynk do deski
		Beton architektoniczny
	Tytan IS 51	Quilosa Termo pro IS 51
		Tynk do deski
		Beton architektoniczny
	Tytan IS 51N	Quilosa Termo pro IS 51N
	Tytan IS 56	Quilosa Termo pro IS 56
	Tytan IS 56N	Quilosa Termo pro IS 56N
	Tytan IS 55	Quilosa Termo pro IS 55
	Tytan IS 55N	Quilosa Termo pro IS 55N
	Tytan IS 52	Quilosa Termo pro IS 52
	Tytan IS 52N	Quilosa Termo pro IS 52N
	Tytan IS 53	Quilosa Termo pro IS 53
	Tytan IS 53N	Quilosa Termo pro IS 53N

Łukasiewicz
Instytut Ceramiki
i Materiałów
Budowlanych

31-983 Kraków,
POLAND
Cementowa Str. 8
Tel.: +48 12 683 79 00
jot@icimb.lukasiewicz.gov.pl
www.icimb.lukasiewicz.gov.pl

Member of EOTA
www.eota.eu

Annex No 6 to **ETA-16/0166 of 29/09/2022**

Control Plan of TYTAN ETICS MW

Control plan has been prepared by Technical Assessment Body: Łukasiewicz Research Network – Institute of Ceramics and Building Materials (Łukasiewicz – ICiMB TAB) in agreement with manufacturer SELENA FM SA. This document is a confidential part of the ETA-16/0166 and can be shared only with Notified Body participating in the procedure of assessment and verification of constancy of performance.

The manufacturer is obliged to notify Łukasiewicz – ICiMB TAB of every changes of the product, production process or the way of use of TYTAN ETICS MW which may lead to errors in the control plan. Łukasiewicz – ICiMB TAB will decide if such changes affect the validity of the ETA-16/0166, thus validity of product CE marking and necessity of again technical assessment or changes in the ETA-16/0166. On request of Łukasiewicz – ICiMB TAB the manufacturer is obliged to present the results confirming that requirements of control plan are met.

CONTROL PLAN OF TYTAN ETICS MW

Table 1a. Components produced by the manufacturer himself

Adhesive: **Tytan IS 12** Adhesive / Base coat: **Tytan IS 22, Tytan IS 23** Key coat: **Tytan IS 41** Finishing coats: **Tytan IS 54,** **Tytan IS 51, Tytan IS 51N,** **Tytan IS 56, Tytan IS 56N,** **Tytan IS 55, Tytan IS 55N,** **Tytan IS 52, Tytan IS 52N,** **Tytan IS 53, Tytan IS 53N** Decorative coats: **Farba elewacyjna silikonowa Tytan IS 73,** **Farba elewacyjna silikatowa Tytan IS 74**			
Subject / type of control	**Test or control method**	**Requirement**	**Frequency of control**
Incoming materials			
Receipt materials	Delivery ticket and/or label on the package	Conformity with the order	Each delivery
	Supplier certificates or supplier tests		
Particle size grading of loose raw materials for the production of the adhesives	According to the prescription of the manufacturer*	According to the prescription of the manufacturer*	
Mixing process			
Mixing process	According to the prescription of the manufacturer*		
Packing			

Table 1b. Components produced by the manufacturer himself – tests on components

Adhesive:**Tytan IS 12**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (powders)	1350 ÷ 1650 kg/m^3	Every production lot
Bond strength between base coat and MW product after curing in dry conditions	EAD 040083-00-0404** cl. 2.2.11.1	≥ 80 kPa or cohesive rupture in insulation	At least once per 6 months
Bond strength between the adhesive and the substrate after curing in dry condition	EAD 040083-00-0404** cl. 2.2.11.2	≥ 250 kPa	At least once per 12 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	≤ 99,5 %	At least once per 24 months

Table 1b. Components produced by the manufacturer himself – tests on components cont.

Adhesives / Base coats: **Tytan IS 22; Tytan IS 23**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (powders)	1300 ÷ 1600 kg/m³	Every production lot
Bond strength between base coat and MW product after curing in dry conditions	EAD 040083-00-0404** cl. 2.2.11.1	≥ 80 kPa or cohesive rupture in insulation	At least once per 6 months
Bond strength between the adhesive and the substrate after curing in dry condition	EAD 040083-00-0404** cl. 2.2.11.2	≥ 250 kPa	At least once per 12 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	≤ 99,5 %	At least once per 24 months

Key coat: **Tytan IS 41**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1278 ÷ 1562 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	51,1 ÷ 59,2 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	83,4 ÷ 88,5 %	At least once per 24 months

Mineral finishing coat: **Tytan IS 54**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (powders)	1350 ÷ 1650 kg/m³	Every production lot
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	94,3 ÷ 99,9 %	At least once per 24 months

Acrylic finishing coat: **Tytan IS 51; Tytan IS 51N**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1649 ÷ 2015 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	79,0 ÷ 91,5 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	88,4 ÷ 98,4 %	At least once per 24 months

Table 1b. Components produced by the manufacturer himself – tests on components cont.

Hybrid finishing coat: **Tytan IS 55; Tytan IS 55N**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1683 ÷ 2057 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	78,6 ÷ 91,0 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	89,0 ÷ 94,5 %	At least once per 24 months

Sol - Silica finishing coat: **Tytan IS 52; Tytan IS 52N**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1665 ÷ 2035 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	78,8 ÷ 91,2 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	89,1 ÷ 99,1 %	At least once per 24 months

Silicone finishing coat: **Tytan IS 53; Tytan IS 53N**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1665 ÷ 2035 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	78,9 ÷ 91,3 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	88,5 ÷ 98,5 %	At least once per 24 months

Mosaic finishing coat: **Tytan IS 56; Tytan IS 56N**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1446 ÷ 1768 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	74,7 ÷ 86,5 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	90,0 ÷ 95,6 %	At least once per 24 months

Table 1b. Components produced by the manufacturer himself – tests on components cont.

Decorative coat: **Farba elewacyjna silikonowa Tytan IS 73**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1368 ÷ 1672 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	56,2 ÷ 65,1 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	78,4 ÷ 83,2 %	At least once per 24 months

Decorative coat: **Farba elewacyjna silikatowa Tytan IS 74**			
Examination	**Method**	**Requirement**	**Frequency of testing**
Finished component			
Density	EAD 040083-00-0404** cl. A.6.1 (pastes and liquids)	1363 ÷ 1665 kg/m³	Every batch
Dry extract	EAD 040083-00-0404** cl. A.6.5	54,8 ÷ 63,0 %	At least once per 6 months
Ash content at 450 °C	EAD 040083-00-0404** cl. A.6.6	86,6 ÷ 92,0 %	At least once per 24 months

Table 2. Tests on glass fibre meshes

Glass fibre meshes: **122** - plan Macedonia; **TYTAN IS 165** (EUROWEK LUX); **SSA-1363-160;** **TYTAN IS 165 A** (HALICO A165); **122** - plant Slovakia			
Examination	**Method**	**Requirement**	**Frequency of testing**
Residual resistance after ageing	EAD 040016-01-0404*** cl. 2.2.7	≥ 20 N/mm	At least once per 36 months
Relative residual resistance after ageing		≥ 50 %	

Table 3. Tests on system

TYTAN ETICS MW			
Examination	**Method**	**Requirement**	**Frequency of testing**
Reaction to fire classification PN-EN 13501-1	EAD 040083-00-0404** Annex B	A2-s2, d0	At least once per 5 years

*Instruction included in the SELENA FM SA. factory production control system.
**EAD 040083-00-0404 – European Assessment Document "External Thermal Insulation Composite Systems (ETICS) with renderings", actual version.
***EAD 040016-01-0404 – European Assessment Document "Glass fibre mesh for reinforcement of cement-based renderings"; ash content and tensile strength testing methods are identical with methods included in EAD 040083-00-0404.

Łukasiewicz
Instytut Ceramiki
i Materiałów
Budowlanych

31-983 Kraków,
POLAND
Cementowa Str. 8
Tel.: +48 12 683 79 00
jot@icimb.lukasiewicz.gov.pl
www.icimb.lukasiewicz.gov.pl

Member of EOTA
www.eota.eu

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Identification of manufacturing plants

According to the declaration of ETA-holder, SELENA FM SA the manufacturing process of the components of TYTAN ETICS MW is realized in plants specified below. The production is realized, among others, under confidential contracts between manufacturer and the owners of manufacturing plants. This Annex is a confidential part of the ETA-16/0166 and can be shared only with Notified Body participating in the procedure of assessment and verification of constancy of performance.

Plant 1: Selena Industrial Technologies Sp. z o.o.
Department of Lubinie – Plant Lubin
Przemysłowa 1A, 59-300 Lubin, POLAND

Plant 2: Selena Industrial Technologies Sp. z o.o.
Strefowa 5, 07-100 Węgrów, POLAND

Plant 3: EURO MGA (www.mga.ro)
Drumul Mare 26-28, Sat Olteni, Comuna Clinceni, Ilfoy 077060, ROMANIA

Plant 4: Morteros Tudel Veguin S.A.
Cam. de Villanubla, 1, C.P.: 47610, Zaratán, Valladolid, SPAIN
Phone number: 00 34983360119

The ETA-holder is obliged to notify Technical Assessment Body - Łukasiewicz Research Network – Institute of Ceramics and Building Materials (Łukasiewicz – ICiMB TAB) of every changes of a place of production. Łukasiewicz – ICiMB TAB will decide if such changes affect the validity of the ETA-16/0166, thus validity of product CE marking and necessity of again technical assessment.

Łukasiewicz Research Network –
Institute of Ceramics and Building Materials

www.icimb.lukasiewicz.gov.pl