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Evaluation Report of

ETA 16/0404
of 29/05/2017

**Technical Assessment Body
issuing the ETA:**

**Institute of Ceramics and Building
Materials ICiMB**

Trade name of the construction product

TECHNITherm EPS

**Product family to which the construction
product belongs**

External Thermal Insulation Composite
Systems (ETICS) with rendering

Manufacturer

TECHNITYNK Sp. z o.o.
Rzeczków-Kolonia 60
26-680 Wierzbica, POLAND

Manufacturing plant

Rzeczków-Kolonia 60
26-680 Wierzbica, POLAND

This Evaluation Report contains

14 pages including 1 Annex which form an
integral part of this Report.

This Evaluation Report replaces

Evaluation Report of ETA 16/0404,
version 1, issued on 12/09/2016

1. Introduction

This Report describes the results of tests and verifications that have been performed to document the performance of TECHNITherm EPS, introduced by TECHNITYNK Sp. z o.o. in accordance with the Essential Requirements, as specified in chapter 5 of the ETAG 004 "Guideline for European Technical Approval of External Thermal Insulation Composite Systems with rendering", edition of February 2013, used as the EAD and hereinafter referred to as ETAG 004.

All information on the components, product as well as the factory production control are deposited at Institute of Ceramics and Building Materials ICiMB. The data included in this Report is a part of the test reports listed in Annex 1.

This Evaluation Report covers the tests to version 1 of ETA 16/0404 (issued on 12/09/2016).

2. Description of TECHNITherm EPS

The components of TECHNITherm EPS are described in Table 1 of the accompanying version of ETA. The manufacturer TECHNITYNK Sp. z o.o. is a producer of all components except insulation product (EPS), glass fibre mesh, anchors and ancillary materials.

3. Results and assessment of performance

3.1. Tests on system

3.1.1. Reaction to fire

The reaction to fire was tested in compliance with Annex D to ETAG 004 (according to EN ISO 1716, EN ISO 11925-2 and EN 13823) and then classified according to EN 13501-1+A1:2010.

Configurations of TECHNITherm EPS (tab. 1) for SBI test were chosen on the basis of organic content (tab. 2) and the heat of combustion (tab. 3). The reaction to fire results are presented in table 4 and 5.

Table 1.

Configuration 1	
Primer	TECHNIGrunt A / GRC Grunt A
Adhesive	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL
Insulation product	EPS panels according to EN 13163, density 16 kg/m ³ , Euroclass E Thickness: 180 mm for EN 13823, 50 mm for EN ISO 11925-2
Base coat	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL
Reinforcement	HALICO A150
Key coat	TECHNIFlex A / Baufest PA 101 / TECHNIFlex A – Farba / GRC Flex A
Finishing coat	TECHNITynk-M / Baufest TM 101 / GRC Tynk M 1,2 mm
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M 1,6 mm
Decorative coat (paint)	TECHNIFarb-SIX

Table 1. cont.

Configuration 2	
Primer	TECHNIGrunt A / GRC Grunt A
Adhesive	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL
Insulation product	EPS panels according to EN 13163, density 16 kg/m ³ , Euroclass E Thickness: 180 mm for EN 13823, 50 mm for EN ISO 11925-2
Base coat	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL
Reinforcement	HALICO A150
Key coat	TECHNIFlex A / Baufest PA 101 / TECHNIFlex A – Farba / GRC Flex A
Adhesive	TECHNISTor
Finishing coat	TECHNIBoard
Decorative coat (paint)	TECHNILako 2w1

Table 2.

		Organic content (%)
Primers	TECHNIGrunt A / GRC Grunt A	3,0
	TECHNIGrunt SN	5,5
	TECHNIGrunt S	4,5
Adhesives	TECHNIKlej N / Baufest BF 100 / GRC Klej N	1,5
	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL	2,0
	TECHNISTor	9,0
Base coats	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL	2,0
Key coats	TECHNIFlex A / Baufest PA 101 / TECHNIFlex A – Farba / GRC Flex A	9,0
	TECHNIFlex SN / Baufest PSN 101 / TECHNIFlex SN – Farba / GRC Flex SN	9,0
	TECHNIFlex S	5,5

Table 2. cont.

		Organic content (%)
Finishing coats	TECHNITynk Mineral Baranek TECHNITynk Mineral Kornik	2,0
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek TECHNITynk-A Kornik / Baufest TA 101 Kornik / GRC Tynk A Kornik	9,0
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M	9,0
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek TECHNITynk-SN Kornik / Baufest TSN 101 Kornik / GRC Tynk SN Kornik	9,0
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek TECHNITynk-SIX Kornik / Baufest TSIX 101 Kornik / GRC Tynk SIX Kornik	9,0
	TECHNITynk-S Baranek / GRC Tynk S Baranek TECHNITynk-S Kornik / GRC Tynk S Kornik	5,5
	TECHNIBoard	9,0
Decorative coats	TECHNIFarb-AZ / GRC Farba AZ	12,0
	TECHNIFarb-SN / GRC Farba SN	12,0
	TECHNIFarb-SIX	12,0
	TECHNIFarb-S	8,5
	TECHNILako 2w1	19,0

Table 3.

		Heat of combustion (MJ/kg)	Heat of combustion (MJ/m ²)
Glass fibre mesh	HALICO A150	6,45	0,97
Adhesive	TECHNISTor	3,36	6,92
Finishing coats	TECHNITynk Mineral Baranek TECHNITynk Mineral Kornik	-0,53	-
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek TECHNITynk-A Kornik / Baufest TA 101 Kornik / GRC Tynk A Kornik	0,92	3,22
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M	1,08	4,32
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek TECHNITynk-SN Kornik / Baufest TSN 101 Kornik / GRC Tynk SN Kornik	0,93	3,26
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek TECHNITynk-SIX Kornik / Baufest TSIX 101 Kornik / GRC Tynk SIX Kornik	0,95	3,33
	TECHNITynk-S Baranek / GRC Tynk S Baranek TECHNITynk-S Kornik / GRC Tynk S Kornik	0,56	1,96
	TECHNIBoard	3,17	12,20
Decorative coats	TECHNIFarb-AZ / GRC Farba AZ	2,41	0,96
	TECHNIFarb-SN / GRC Farba SN	2,14	0,86
	TECHNIFarb-SIX	2,48	0,99
	TECHNIFarb-S	1,33	0,53
	TECHNILako 2w1	18,98	1,52

Table 4.

Testing procedure	Parameter	Average value	
		TECHNITynk-M / Baufest TM 101 / GRC Tynk M 1,2 mm	TECHNITynk-M / Baufest TM 101 / GRC Tynk M 1,6 mm
EN 13823	FIGRA _{0,2 MJ} (W/s)	79,29	79,22
	FIGRA _{0,4 MJ} (W/s)	100,50	81,93
	THR _{600s} (MJ)	4,93	2,93
	SMOGRA (m ² /s ²)	5,10	7,41
	TSP _{600s} (m ²)	52,27	49,13
	LFS < edge of the sample	yes	yes
	Flaming droplets	no	no
EN ISO 11925-2	F _s ≤ 150 mm in 60 s	yes	yes
	no inflammation of filter paper	yes	yes
Class acc. to EN 13501-1	B-s2, d0		

Table 5.

Testing procedure	Parameter	Average value
		TECHNIBoard
EN 13823	FIGRA _{0,2 MJ} (W/s)	49,55
	FIGRA _{0,4 MJ} (W/s)	77,81
	THR _{600s} (MJ)	8,53
	SMOGRA (m ² /s ²)	8,55
	TSP _{600s} (m ²)	67,44
	LFS < edge of the sample	yes
	Flaming droplets	no
EN ISO 11925-2	F _s ≤ 150 mm in 60 s	yes
	no inflammation of filter paper	yes
Class acc. to EN 13501-1	C-s2, d0	

3.1.2. Water absorption

The tests were performed according to clause 5.1.3.1 of ETAG 004. Results are presented in table 6.

Table 6.

		Average water absorption (kg/m ²) after	
		1 hour	24 hours
Base coat			
TECHNIKlej EL / Baufest BF 101 / GRC Klej EL		0,06	0,47
Rendering system: Base coat <u>TECHNIKlej EL / Baufest BF 101 / GRC Klej EL</u> + relevant key coat + finishing coat indicated hereafter:	TECHNITynk Mineral Baranek (2,0 mm)	0,15	0,40
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek (2,5 mm)	0,03	0,37
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M (1,6 mm)	0,03	0,28
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek (2,5 mm)	0,02	0,24
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek (2,5 mm)	0,02	0,28
	TECHNITynk-S Baranek / GRC Tynk S Baranek (2,5 mm)	0,30	0,45
	TECHNIBoard + TECHNILako 2w1	0,05	0,30

3.1.3. Hygrothermal behaviour

The tests were performed according to clause 5.1.3.2.1 of ETAG 004. Composition of the tested rig prepared by manufacturer is given in table 7.

Table 7.

	Rig
Insulation product	EPS panels acc. to EN 13163, TR80
Base coat	TECHNIKlej EL / Baufest BF 101 / GRC Klej EL
Glass fibre mesh	HALICO A150
Key coat + Finishing coat	TECHNIFlex A / Baufest PA 101 / TECHNIFlex A – Farba / GRC Flex A + TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek (1,0 mm)
	TECHNIFlex SN / Baufest PSN 101 / TECHNIFlex SN – Farba / GRC Flex SN + TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek (1,0 mm)
	TECHNIFlex A / Baufest PA 101 / TECHNIFlex A – Farba / GRC Flex A + TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek (1,0 mm)
	TECHNIFlex S + TECHNITynk-S Baranek / GRC Tynk S Baranek (1,0 mm)

None of the following defects occurred during and after the testing:

- blistering or peeling of any part of rendering system;
- failure or cracking associated with joints between insulation product panels;
- detachment of the render;
- cracking allowing water penetration to the insulation layer.

Finishing coats not tested on the rig were examined according to clause 5.1.7.1.2 of ETAG 004.

3.1.4. Freeze-thaw behaviour

Water absorption of rendering systems after 24 hours was lower than 0,5 kg/m² (tab. 6), therefore TECHNITherm EPS can be considered as freeze/thaw resistant without any further testing (ETAG 004: clause 5.1.3.2.2).

3.1.5. Impact resistance

The tests were performed on the rig after heat-rain and heat-cold cycles according to clause 5.1.3.3 of ETAG 004. Finishing coats not tested on the rig were tested after water immersion and drying in accordance with clause 5.1.7.1.2 of ETAG 004. Obtained categories are presented in table 8.

Table 8.

		Single layer of HALICO A150
Rendering system: Base coat <u>TECHNIKlej EL / Baufest BF 101 / GRC Klej EL</u> + relevant key coat + finishing coat indicated hereafter:	TECHNITynk Mineral Kornik (1,5 mm)	Category III
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek (1,0 mm)	Category III
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M (1,2 mm)	Category II
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek (1,0 mm)	Category III
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek (1,0 mm)	Category III
	TECHNITynk-S Baranek / GRC Tynk S Baranek (1,0 mm)	Category III
	TECHNIBoard + TECHNILako 2w1	Category I

3.1.6. Water vapour permeability

The water vapour permeability was tested according to clause 5.1.3.4 of ETAG 004. The results are given in table 9.

Table 9.

		Average equivalent air thickness s_d
Rendering system: Base coat <u>TECHNIKlej EL /</u> <u>Baufest BF 101 / GRC</u> <u>Klej EL</u> + relevant key coat + finishing coat indicated hereafter + relevant decorative coat:	TECHNITynk Mineral Baranek (2,0 mm) + - TECHNIFarb-SN / GRC Farba SN - TECHNIFarb-S	0,09 m 0,07 m
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek (2,5 mm) + TECHNIFarb-AZ / GRC Farba AZ	0,33 m
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M (1,6 mm)*	0,16 m
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek (2,5 mm) + TECHNIFarb-SN / GRC Farba SN	0,18 m
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek (2,5 mm) + TECHNIFarb-SIX	0,22 m
	TECHNITynk-S Baranek / GRC Tynk S Baranek (2,5 mm) + TECHNIFarb-S	0,15 m
	TECHNIBoard + TECHNILako 2w1	0,30 m

*decorative coat not used

3.1.7. Release of dangerous substances (ETAG 004: clause 5.1.3.5, EOTA TR034)

Performance was not assessed.

3.1.8. Bond strength between base coat and insulation product

The test was performed in accordance with clause 5.1.4.1.1 of ETAG 004. The results are presented in table 10.

Table 10.

		Bond strength (MPa)		
		average	min	number of test results in range 0,06-0,08
TECHNIKlej EL / Baufest BF 101 / GRC Klej EL	after 28 days of drying	0,08*	0,08	0
	after hygrothermal cycles	0,16*	0,11	0

*cohesive rupture in insulation

3.1.9. Bond strength between adhesive and substrate

The tests were carried out according to clause 5.1.4.1.2 of ETAG 004. The results are given in table 11.

Table 11.

		Bond strength (MPa)			
		average	min	number of test results in range	
TECHNIKlej N / Baufest BF 100 / GRC Klej N*	under dry conditions	0,63	0,55	0,20-0,25	0
	2 days in water + 2 hours of drying	0,37	0,33	0,06-0,08	0
	2 days in water + 7 days of drying	1,67	1,05	0,20-0,25	0
TECHNIKlej EL / Baufest BF 101 / GRC Klej EL*	under dry conditions	0,49	0,46	0,20-0,25	0
	2 days in water + 2 hours of drying	0,32	0,29	0,06-0,08	0
	2 days in water + 7 days of drying	1,17	0,79	0,20-0,25	0

*thickness of adhesive – about 3,0 mm

3.1.10. Bond strength between adhesive and insulation product

The tests were carried out according to clause 5.1.4.1.3 of ETAG 004. The results are given in table 12.

Table 12.

		Bond strength (MPa)		
		average	min	number of test results in range 0,06-0,08
TECHNIKlej N / Baufest BF 100 / GRC Klej N*	under dry conditions	0,10**	0,10	0
	2 days in water + 2 hours of drying	0,07***	0,05	-
	2 days in water + 7 days of drying	0,10**	0,10	0
TECHNIKlej EL / Baufest BF 101 / GRC Klej EL*	under dry conditions	0,10**	0,10	0
	2 days in water + 2 hours of drying	0,08***	0,06	-
	2 days in water + 7 days of drying	0,10**	0,09	0

*thickness of adhesive – about 3,0 mm; **cohesive rupture in insulation; ***adhesive rupture

3.1.11. Bond strength after ageing

The tests were carried out according to clause 5.1.7.1 of ETAG 004. The results are given in table 13.

Table 13.

		Bond strength after hygrothermal cycles (MPa)	
		average	min
Rendering system: Base coat <u>TECHNIKlej EL /</u> <u>Baufest BF 101 /</u> <u>GRC Klej EL +</u> relevant key coat + finishing coat indicated hereafter:	TECHNITynk Mineral Kornik (1,5 mm)	0,12*	0,11
	TECHNITynk-A Baranek / Baufest TA 101 Baranek / GRC Tynk A Baranek (1,0 mm)	0,10**	0,09
	TECHNITynk-M / Baufest TM 101 / GRC Tynk M (1,2 mm)	0,11*	0,10
	TECHNITynk-SN Baranek / Baufest TSN 101 Baranek / GRC Tynk SN Baranek (1,0 mm)	0,13**	0,12
	TECHNITynk-SIX Baranek / Baufest TSIX 101 Baranek / GRC Tynk SIX Baranek (1,0 mm)	0,12**	0,10
	TECHNITynk-S Baranek / GRC Tynk S Baranek (1,0 mm)	0,15*	0,12
	TECHNIBoard + TECHNILako 2w1	0,10*	0,09

*cohesive rupture in insulation; **adhesive/cohesive rupture in insulation

3.1.12. Fixing strength and wind load resistance

TECHNITherm EPS is a fully or a partially bonded system with supplementary anchors. It is not classified as a system to be mechanically fixed, therefore according to ETAG 004 examinations of fixing strength and wind load resistance are not required.

3.1.13. Thermal resistance

See clause 3.5.1 of ETA.

3.2. Tests on components

3.2.1. Insulation product

Factory-prefabricated panels of expanded polystyrene (EPS) in accordance with the description and characteristics given in accompanying version of ETA.

3.2.2. Render strip tensile test (ETAG 004: clause 5.5.4.1)

Performance was not assessed.

3.2.3. Glass fibre mesh

The tensile strength was tested in accordance with clause 5.6.7.1 of ETAG 004. The results are presented in table 14.

Table 14.

	Average tensile strength (N/mm)		Average tensile strength after ageing (N/mm)		Residual strength after ageing (%)	
	warp	weft	warp	weft	warp	weft
HALICO A150	42,7	35,9	35,3	25,4	82,7	70,8

3.3. Identification tests of the components

The identification tests of TECHNITherm EPS components were performed in accordance with Annex C of ETAG 004. The results are deposited at Institute of Ceramics and Building Materials ICiMB. The results may be sent to other TABs of EOTA only on request. In such case they are considered as strictly confidential.

Krakow, 29.05.2017

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Annex No 1: Technical documentation

- ETA application TECHNITYNK Sp. z o.o.
- TECHNITherm EPS instruction of use, TECHNITYNK Sp. z o.o.
- Reports on classification of reaction to fire No SG-60/16/N, SG-02/17/N, ICiMB/Division in Krakow, June 2016, February 2017
- Test reports No: 101/16/SG/N, 102/16/SG/N, 103/16/SG/N, 104/16/SG/N, 06/17/SG/N and 07/17/SG/N on reaction to fire, ICiMB/Division in Krakow, June 2016, February 2017
- Test reports No: 538/14/BC, 15/17/BC/N, 16/17/BC/N and 17/17/BC/N on heat of combustion, ICiMB/Division in Krakow, November 2014, February 2017
- Test reports No: 14/KAL/2015/T1 to 14/KAL/2015/T10 on heat of combustion, IGNIS REACTION TO FIRE, Biała Podlaska/Swory, October and November 2015
- Test reports No: 334/16/SG, 335/16/SG, 336/16/SG, 337/16/SG, 338/16/SG, 339/16/SG, 341/16/SG and 64/17/SG on water absorption, ICiMB/Division in Krakow, May 2016, February 2017
- Test reports No: 334/16/SG, 335/16/SG, 336/16/SG, 337/16/SG, 338/16/SG, 339/16/SG, 341/16/SG, 342/16/SG and 64/17/SG on water vapour permeability, ICiMB/Division in Krakow, May 2016, February 2017
- Test report No 294/04/2016 on hygrothermal behaviour, Centralne Laboratorium Badawcze Henkel Polska Sp. z o.o., Stara Góra/Stąporków, July 2016
- Test report No 294/04/2016 on impact resistance, Centralne Laboratorium Badawcze Henkel Polska Sp. z o.o., Stara Góra/Stąporków, July 2016
- Test reports No: 340/16/SG, 360/16/SG and 64/17/SG on impact resistance, ICiMB/Division in Krakow, May 2016, February 2017
- Test report No 294/04/2016 on bond strength, Centralne Laboratorium Badawcze Henkel Polska Sp. z o.o., Stara Góra/Stąporków, July 2016
- Test reports No: 334/16/SG, 340/16/SG, 359/16/SG, 360/16/SG, 397/16/SG and 64/17/SG on bond strength, ICiMB/Division in Krakow, May and June 2016, February 2017
- Test reports No: 343/16/SG, 344/16/SG, 345/16/SG, 346/16/SG, 347/16/SG, 348/16/SG, 349/16/SG, 350/16/SG, 351/16/SG, 352/16/SG, 353/16/SG, 354/16/SG, 355/16/SG, 356/16/SG, 357/16/SG, 358/16/SG, 359/16/SG, 397/16/SG, 61/17/SG, 62/17/SG, 63/17/SG, 581/16/SK, 582/16/SK, 583/16/SK, 584/16/SK, 585/16/SK, 586/16/SK, 587/16/SK, 588/16/SK, 589/16/SK, 590/16/SK, 591/16/SK, 592/16/SK, 593/16/SK, 594/16/SK, 595/16/SK, 596/16/SK, 597/16/SK, 598/16/SK, 1160/16/SK, 1161/16/SK, 1162/16/SK, 249/17/SK, 250/17/SK and 251/17/SK on identification of TECHNITherm EPS components, ICiMB/Division in Krakow, April, May, June and July 2016, February 2017
- Test reports of glass fibre mesh HALICO A150 No: 3/15/SG and 99/15/SK, ICiMB/Division in Krakow, January 2015
- Technical Approval of glass fibre mesh HALICO A150 No AT-15-8963/2015, ITB, Warsaw, April 2015