

European Technical Assessment



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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	Knauf Thermo Wood
Product family to which the construction product belongs	04: ETICS with renderings for the use on timber frame buildings
Manufacturer	Knauf Sp. z o.o. ul. Światowa 25, 02-229 Warszawa, POLSKA
Manufacturing plant	Plant A; Plant B; Plant C
This European Technical Assessment contains	25 pages including 2 Annexes which form an integral part of this assessment. Annexes No 3 Control Plan and No 4 Identification of manufacturing plants contain confidential information and are not included in the European Technical Assessment when that assessment is publicly available.
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 040089-00-0404 ed. January 2019 – External Thermal Insulation Composite Systems (ETICS) with renderings

Corrigendum

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

1. Technical description of the product:

This product Knauf Thermo Wood is an External Thermal Insulation Composite System (ETICS) with renderings for the use on timber frame buildings – 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 or bonded with supplementary mechanical fixings or mechanically fixed with supplementary adhesive on external boards. The external boards can be wood based panels, plasterboard, cement bonded particle boards, fibre-gypsum panels and similar products. The method of fixing and the relevant components are specified in Table 1. The insulation product is faced with a rendering system consisting of several layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating boards, without any air gap or disconnecting layer.

The ETICS may include special fittings (e.g. base profiles, corner profiles, rustication strips, expansion joints, sealing and finishing 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 or bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	<ul style="list-style-type: none"> • Insulation products: Boards of expanded polystyrene (EPS) according to PN-EN 13163: - KNAUF Therm PRO Fasada/Dach/Podłoga EPS 70 λ 38 (TYP EPS 70) - 50 to 250 - KNAUF Therm Tech Fasada λ 40 (TYP EPS S) - 50 to 300 - KNAUF Therm Tech Fasada λ 42 (TYP EPS S) - 50 to 300 - KNAUF ETIXX Fasada λ 31 (TYP EPS S) - 120 to 300 - KNAUF Therm PRO Fasada/Dach/Podłoga EPS 80 λ 37 (TYP EPS 80) - 50 to 300 - KNAUF Therm Expert Fasada/Dach/Podłoga EPS 80 λ 31 (TYP EPS 80) - 50 to 300 <p><i>Product characteristics - see Annex No 1</i></p>		
	<ul style="list-style-type: none"> • Adhesives: - Knauf KS 300 Klej do styropianu Cement based powder requiring addition of 0,25 l/kg of water about 4,0 (powder) - - Knauf K 600 Klej do zatapiania siatki Cement based powder requiring addition of 0,24 l/kg of water about 4,0 (powder) - - Knauf KZW 700 Klej zbrojony z włóknem Cement based powder requiring addition of 0,26 l/kg of water about 4,0 (powder) - - SPEEDERO polyurethane foam Ready to use polyurethane foam to be used on OSB board and plasterboard 94 to 125 ml/m² - 		

Table 1. cont.

	Components	Coverage (kg/m ²)	Thickness (mm)
Bonded ETICS or bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.			
Base coats	- Knauf K 600 Klej do zatapiania siatki Cement based powder requiring addition of 0,24 l/kg of water	about 4,0 (powder)	4,0 to 5,0
	- Knauf KZW 700 Klej zbrojony z włóknem Cement based powder requiring addition of 0,26 l/kg of water	about 4,0 (powder)	4,0 to 5,0
Reinforcement	• Standard glass fiber meshes		
	- Knauf Siatka zbrojąca 165 A	-	-
	- Knauf Siatka zbrojąca 165 B	-	-
	- Knauf Siatka zbrojąca 165 C <i>Product characteristic - Annex No 2</i>	-	-
Key coats	- Knauf Universalgrund Ready to use liquid to be used on: - plasterboard - gypsum fibre - cement board	0,15 to 0,25 l/m ²	-
	- Knauf Spezialhaftgrund Ready to use liquid to be used on: - OSB board - plywood	0,06 to 0,08 l/m ²	-
	- Knauf Putzgrund podkład pod tynk Ready to use liquid to be used with finishing coats	0,3 to 0,5	-
Finishing coats	- Knauf Mosaic Tynk mozaikowy mosaic structure max. particle size: 0,8 ÷ 1,2; 1,0 ÷ 1,6 mm	3,5 to 4,7	Regulated by particle size

Table 1. cont.

Components	Coverage (kg/m ²)	Thickness (mm)	
Bonded ETICS or bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.			
Finishing coats	<ul style="list-style-type: none"> - Knauf Deco Design mosaic structure max. particle size: 0,8 ÷ 1,2; 1,0 ÷ 1,6 mm 	3,5 to 4,7	Regulated by particles size
	<ul style="list-style-type: none"> • Silicate finishing coats Knauf KATI Tynk silikatowy Ready to use paste – silicate binder 		
	<ul style="list-style-type: none"> - Knauf KATI S Baranek floated structure max. particle size: 1,5; 2,0; 3,0 mm 	2,3 to 4,2	
	<ul style="list-style-type: none"> - Knauf KATI R Kornik ribbed structure max. particle size: 2,0; 3,0 mm 	2,4 to 3,4	
	<ul style="list-style-type: none"> • Silicone finishing coats Knauf CONNI Tynk silikatowy Ready to use paste – silicone binder 		
	<ul style="list-style-type: none"> - Knauf CONNI S Baranek floated structure max. particle size: 1,0; 1,5; 2,0; 3,0 mm 	1,6 to 4,2	
	<ul style="list-style-type: none"> - Knauf CONNI R Kornik ribbed structure max. particle size: 2,0; 3,0 mm 	2,4 to 3,4	
<ul style="list-style-type: none"> • Siloxane finishing coats Knauf OXXI Tynk siloksanowy Ready to use paste – siloxane binder floated structure max. particle size: 1,5; 2,0 mm 	2,4 to 3,6		

Table 1. cont.

	Components	Coverage (kg/m ²)	Thickness (mm)
Bonded ETICS or bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.			
Finishing coats	<ul style="list-style-type: none"> • Acrylic finishing coat Knauf ADDI Tynk akrylowy Ready to use paste – acrylic binder - Knauf ADDI S Baranek floated structure max. particle size: 1,5; 2,0; 3,0 mm - Knauf ADDI R Kornik ribbed structure max. particle size: 2,0; 3,0 mm • Mineral finishing coats - Knauf SP 260 Tynk mineralny Powder requiring addition of water in ratio 100 : (27,2) floated structure max. particle size: 1,5; 2,0, 3,0 mm - Knauf RP 240 Tynk mineralny Powder requiring addition of water in ratio 100 : (27,2) ribbed structure max. particle size: 2,0; 3,0 mm 	<p>2,4 to 4,2</p> <p>2,4 to 3,4</p> <p>2,3 to 4,0</p> <p>2,2 to 2,7</p>	Regulated by particles size
Decorative coats (paints)	Knauf Farba silikonowa egalizacyjna Ready to use liquid to be used with mineral finishing coat	0,2 to 0,3	-
Ancillary materials	Remain under the manufacturer's responsibility		

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

This ETICS is designed to give the timber frame building wall to which it is applied additional thermal insulation and protection from effects of weathering.

The ETICS can be used on new or existing (retrofit) vertical timber frame building walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The surface for the application of bonded ETICS or bonded ETICS with supplementary mechanical fixings can be a board substrate: plasterboard acc. to EN 520, gypsum fibre acc. to EN 15283-2, cement – AQUAPANEL acc. to ETA 07/0173, OSB board acc. to EN 13986, plywood acc. to EN 314-2. The board substrate must be suitable for humid conditions as specified in EN 13986.

The ETICS is non load-bearing construction element. It does not contribute directly to the stability of the timber frame building wall on which it is installed. The verification of the structural capacities of the wall and their suitability for the application of ETICS shall be in accordance with EAD 040089-00-0404, clause 5.1 using calculation methods (EN 1995-1-1 – Eurocode 5 Part 1-1, etc.) as well as verifications by testing (EN 380, EN 594, EN 595, EN 596, etc.) where the load bearing capacity is unable to calculate.

The ETICS can contribute to the durability of a timber frame building by providing enhanced protection from the effects of weathering.

The ETICS is not intended to ensure the airtightness of the timber frame building structure. The timber frame building wall as such has therefore to be airtight to:

- a) reduce the thermal transmittance of the wall
- b) avoid interstitial condensation due to convection.

The provisions made in this European Technical Assessment are based on an assumed working life of the ETICS on timber frames of at least 25 years, provided that the requirements for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical Assessment Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected, economically reasonable working life of the works.

The works shall be executed by trained installers. Installation, maintenance and repair of ETICS shall be done in accordance with manufacturer's instructions and technical documentation.

Design, installation and execution of ETICS shall be in conformity with Member States legislation requirements.

The instructions regarding packaging, transport, storage and installation of ETICS are specified in the manufacturer's technical documentation.

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

The performances of the kit as described in this chapter are valid provided that the components of the kit comply with Annexes No 1+2.

3.1. Safety in case of fire (BWR 2)

3.1.1. Reaction to fire of the ETICS (EAD 040089-00-0404: clause 2.2.1.1, EN 13501-1)

Table 2.

Configuration	Max. heat of combustion [MJ/kg]	Flame retardant content	Class acc. to EN 13501-1
Polyurethane foam	27,41	No flame retardant	B-s2, d0
EPS boards <i>density ≤ 14,0 kg/m³</i>	-		
Base coat	- 0,21		
Glass fibre mesh	10,18		
Key coat	3,54		
Finishing coat	3,25		
Decorative coat	4,62		

Note: European reference fire scenario has not been laid down for facades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in facades. An additional assessment of ETICS according to national provisions might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.1.2. Reaction to fire of insulation product (EAD 040089-00-0404: clause 2.2.1.3, EN 13501-1)

See Annex No 1

3.1.3. Reaction to fire of mechanical fixings (EAD 040089-00-0404: clause 2.2.1.2)

No performance assessed.

3.2. Hygiene, health and environment (BWR 3)

3.2.1. Water absorption of the ETICS (EAD 040089-00-0404: clause 2.2.2.1)

- Base coat KZW 700:
 - Water absorption after 1 hour = 0,1 kg/m²;
 - Water absorption after 24 hours = 0,4 kg/m².
- Base coat Knauf K 600:
 - Water absorption after 1 hour = 0,1 kg/m²;
 - Water absorption after 24 hours = 0,4 kg/m².
- Rendering systems: Table 3.

Table 3.

		Water absorption after 1 hour	Water absorption after 24 hours
		mean value (kg/m ²)	
Rendering system: Base coat Knauf KZW 700 + key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP 260	0,1	0,4
	Knauf RP 240	0,1	0,4
	Knauf ADDI S	0,0	0,2
	Knauf OXXI	0,1	0,2
	Knauf KATI S	0,3	0,5
	Knauf CONNI S	0,1	0,2
	Knauf Mosaic	0,0	0,1
	Knauf Deco Design	0,0	0,1
Rendering system: Base coat Knauf K 600 + key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP 260	0,2	0,4
	Knauf RP 240	0,2	0,4
	Knauf ADDI S	0,5	0,2
	Knauf OXXI	0,1	0,3
	Knauf KATI S	0,4	0,6
	Knauf CONNI S	0,5	0,2
	Knauf Mosaic	0,5	0,1
	Knauf Deco Design	0,5	0,1

3.2.2. Water tightness of the ETICS: Hygrothermal behaviour (EAD 040089-00-0404: clause 2.2.2.2)

Pass (without defects).

3.2.3. Water tightness of the ETICS: Freeze-thaw behaviour (EAD 040089-00-0404: clause 2.2.2.3)

ETICS is frost resistant according to water absorption test and freeze-thaw test.

3.2.4. Water tightness of the ETICS: Water penetration (EAD 040089-00-0404: clause 2.2.2.5)

No performance assessed.

3.2.5. Water vapour permeability of the ETICS (EAD 040089-00-0404: clause 2.2.2.6)

Table 4.

		Average equivalent air thickness s_d (m)
Rendering system: Base coat Knauf KZW 700 + Key coat Knauf Putzgrund + finishing coat + decorative coat (if relevant):	Knauf SP 260	0,1
	Knauf SP 260 + Knauf Farba silikonowa	0,1
	Knauf RP 240	0,1
	Knauf RP 240 + Knauf Farba silikonowa	0,1
	Knauf ADDI S	0,3
	Knauf OXXI	0,3
	Knauf KATI S	0,2
	Knauf CONNI S	0,3
	Knauf Mosaic	0,4
Knauf Deco Design	0,4	
Rendering system: Base coat Knauf K 600 + Key coat Knauf Putzgrund + finishing coat + decorative coat (if relevant):	Knauf SP 260	0,1
	Knauf SP 260 + Knauf Farba silikonowa	0,1
	Knauf RP 240	0,1
	Knauf RP 240 + Knauf Farba silikonowa	0,1
	Knauf ADDI S	0,3
	Knauf OXXI	0,4
	Knauf KATI S	0,2
	Knauf CONNI S	0,3
	Knauf Mosaic	0,4
Knauf Deco Design	0,4	

3.2.6. Water absorption of insulation product (EAD 040089-00-0404: clause 2.2.2.7)

No performance assessed.

3.2.7. Water vapour permeability of insulation product (EAD 040089-00-0404: clause 2.2.2.8)

See Annex No 1

3.3. Safety and accessibility in use (BWR 4)

3.3.1. Bond strength between base coat and insulation product (EAD 040089-00-0404: clause 2.2.3.1)

Table 5.

		Bond strenght (MPa)	
		mean	min.
Knauf KZW 700	initial state	0,10	0,10
	hygrothermal cycles (from the rig)	0,11	0,10
Knauf K 600	initial state	0,11	0,10
	hygrothermal cycles (from the rig)	0,11	0,10

3.3.2. Bond strength between adhesive and substrate (EAD 040089-00-0404: clause 2.2.3.2)

Table 6.

		Bond strenght (MPa)	
		mean	min.
Plasterboard			
KNAUF KS 300	initial state	0,21	0,18
	7 days 23°C/95% RH	0,17	0,16
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,21	0,20
KNAUF K 600	initial state	0,12	0,08
	7 days in 23°C/95% RH	0,07	0,04
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,08	0,05
KNAUF KZW 700	initial state	0,25	0,21
	7 days 23°C/95% RH	0,16	0,13
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,20	0,19

Table 6. cont.

		Bond strenght (MPa)	
		mean	min.
Gypsum fibre board			
KNAUF KS 300	initial state	0,14	0,13
	7 days 23°C/95% RH	0,10	0,09
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,11	0,10
KNAUF K 600	initial state	0,18	0,16
	7 days in 23°C/95% RH	0,14	0,12
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,17	0,15
KNAUF KZW 700	initial state	0,17	0,13
	7 days 23°C/95% RH	0,14	0,13
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,17	0,15
Cement board			
KNAUF KS 300	initial state	0,15	0,13
	7 days 23°C/95% RH	0,10	0,08
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,11	0,09
KNAUF K 600	initial state	0,25	0,20
	7 days in 23°C/95% RH	0,29	0,16
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,22	0,19
KNAUF KZW 700	initial state	0,25	0,22
	7 days 23°C/95% RH	0,18	0,13
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,20	0,17
OSB board			
KNAUF KS 300	initial state	0,05	0,04
	7 days 23°C/95% RH	0,04	0,03
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,05	0,04
KNAUF K 600	initial state	0,06	0,04
	7 days 23°C/95% RH	0,03	0,02
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,06	0,05

Table 6. cont.

		Bond strenght (MPa)	
		mean	min.
OSB board			
KNAUF KZW 700	initial state	0,04	0,03
	7 days 23°C/95% RH	0,03	0,03
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,05	0,04
Plywood			
KNAUF KS 300	initial state	0,21	0,16
	7 days 23°C/95% RH	0,14	0,12
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,19	0,17
KNAUF K 600	initial state	0,13	0,09
	7 days 23°C/95% RH	0,08	0,07
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,09	0,07
KNAUF KZW 700	initial state	0,31	0,28
	7 days 23°C/95% RH	0,16	0,12
	7 days 23°C/95% RH + 7 days 23°C/50% RH	0,20	0,18
Concrete slab			
KNAUF KS 300	48 hours immersion in water + 2 hours 23°C/50% RH	0,57	0,52
KNAUF K 600		0,44	0,39
KNAUF KZW 700		0,49	0,47

3.3.3. Bond strength between adhesive and insulation product (EAD 040089-00-0404: clause 2.2.3.3)

Table 7.

		Bond strenght (MPa)	
		mean	min.
Knauf KZW 700	initial state	0,10	0,09
	48 hours immersion in water + 2 hours 23°C/50% RH	0,09	0,08
	48 hours immersion in water + 7 days 23°C/50% RH	0,10	0,10
Knauf K 600	initial state	0,11	0,10
	48 hours immersion in water + 2 hours 23°C/50% RH	0,10	0,09
	48 hours immersion in water + 7 days 23°C/50% RH	0,11	0,10
Knauf KS 300	initial state	0,11	0,10
	48 hours immersion in water + 2 hours 23°C/50% RH	0,10	0,09
	48 hours immersion in water + 7 days 23°C/50% RH	0,11	0,10

3.3.4. Bond strength of foam adhesive (EAD 040089-00-0404: clause 2.2.3.4)

Table 8.

	Bond strenght (MPa) (minimal bonded surface area S: 40 %)		
	mean	min.	Number of test results in range 0,06-0,08
Plasterboard			
standard application conditions	0,08*	0,08	0
modification of foam thickness (16 mm)	0,08*	0,07	1
modification of open time (10 minut)	0,08**	0,08	0
modification of temperature (25 ± 5 °C)	0,08*	0,07	2
modification of temperature (5 ± 2 °C)	0,08*	0,07	1
OSB board			
standard application conditions	0,09**	0,06	1
modification of foam thickness (15 mm)	0,08**	0,07	2
modification of open time (5minut)	0,12**	0,11	0
modification of temperature (35 °C)	0,11**	0,10	0
modification of temperature (5 °C)	0,11**	0,09	0

*cohesive rupture in insulation, **cohesive rupture in foam

3.3.5. Fixing strength (transverse displacement) (EAD 040089-00-0404, clause 2.2.3.5)

Test not required. ETICS fulfils the criteria $E \cdot d \leq 50\,000\text{ N/mm}$.

3.3.6. Wind load resistance of mechanically fixed ETICS

3.3.6.1. Pull-through tests of fixings (EAD 040089-00-0404, clause 2.2.3.6.1)

No performance assessed.

3.3.7. Impact resistance (EAD 040089-00-0404: clause 2.2.3.19)

Table 9.

		Hard body impact		
		Impact energy 3 J	Impact energy 10 J	Impact resistance category
		Impact diameter (mm) / damages		
Rendering system: Base coat Knauf KZW 700 + Key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP 260	10 / no damages	21 / cracks without reaching the thermal insulation product	II
	Knauf RP 240	10 / no damages	21 / cracks without reaching the thermal insulation product	II
	Knauf ADDI S	7 / no damages	20 / no damages	I
	Knauf OXXI	0 / no damages	10 / no damages	I
	Knauf KATI S	0 / no damages	8 / no damages	I
	Knauf CONNI S	17 / no damages	38 / cracks without reaching the thermal insulation product	II
	Knauf Mosaic	0 / no damages	7 / no damages	I
	Knauf Deco Design	0 / no damages	7 / no damages	I

Table 9.cont.

		Hard body impact		
		3 J	10 J	Impact resistance category
		Impact diameter (mm) / damages		
Rendering system: Base coat Knauf K 600 + Key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP 260	11 / no damages	30 / cracks without reaching the thermal insulation product	II
	Knauf RP 240	11 / no damages	30 / cracks without reaching the thermal insulation product	II
	Knauf ADDI S	11 / no damages	25 / cracks without reaching the thermal insulation product	II
	Knauf OXXI	5 / no damages	23 / no damages	I
	Knauf KATI S	11 / no damages	28 / no damages	I
	Knauf CONNI S	9 / no damages	25 / cracks without reaching the thermal insulation product	II
	Knauf Mosaic	12 / no damages	27 / no damages	I
	Knauf Deco Design	12 / no damages	27 / no damages	I

3.3.8. Bond strength after ageing (EAD 040089-00-0404: clause 2.2.3.20 and 2.2.3.21)

Table 10.

		Bond strength after hygrothermal cycles (MPa)	
		individual values	mean
Rendering system: Base coat Knauf KZW 700 + Key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP 260	0,11	0,11
		0,11	
		0,10	
		0,10	
		0,10	
	Knauf RP 240	0,11	0,11
		0,11	
		0,10	
		0,10	
	Knauf ADDI S	0,10	0,12
		0,11	
		0,12	
		0,12	
	Knauf OXXI	0,12	0,12
		0,12	
		0,12	
		0,11	
	Knauf KATI S	0,11	0,11
		0,11	
		0,10	
		0,10	
	Knauf CONNI S	0,11	0,11
		0,10	
		0,11	
		0,10	
	Knauf Mosaic	0,11	0,12
		0,10	
		0,12	
0,12			
Knauf Deco Design	0,11	0,12	
	0,10		
	0,12		
	0,12		
		0,11	

Table 10. cont.

		Bond strenght after hygrothermal cycles (MPa)	
		individual values	mean
Rendering system: Base coat Knauf K 600 + Key coat Knauf Putzgrund + finishing coat indicated hereafter:	Knauf SP	0,10	0,11
		0,10	
		0,11	
		0,10	
		0,11	
	Knauf RP 240	0,10	0,11
		0,10	
		0,11	
		0,10	
		0,11	
	Knauf ADDI S	0,10	0,11
		0,10	
		0,11	
		0,11	
		0,11	
	Knauf OXXI	0,11	0,10
		0,11	
		0,11	
		0,10	
		0,10	
Knauf KATI S	0,10	0,11	
	0,10		
	0,12		
	0,11		
	0,11		
Knauf CONNI S	0,11	0,11	
	0,10		
	0,11		
	0,10		
	0,10		
Knauf Mosaic	0,14	0,13	
	0,13		
	0,11		
	0,13		
	0,12		
Knauf Deco Design	0,14	0,13	
	0,13		
	0,11		
	0,13		
	0,12		

3.3.9. Tensile resistance of insulation product in dry conditions (EAD 040089-00-0404: clause 2.2.3.7)

See Annex No 1

3.3.10. Tensile resistance of insulation product in wet conditions (EAD 040089-00-0404: clause 2.2.3.8)

No performance assessed.

3.3.11. Shear strength and shear modulus of elasticity of insulation product (EAD 040089-00-0404: clause 2.2.3.9)

See Annex No 1

3.3.12. Pull-out strength of mechanical fixings (EAD 040089-00-0404: clause 2.2.3.14)

No performance assessed.

3.3.13. Protection against corrosion of mechanical fixings (EAD 040089-00-0404: clause 2.2.3.22)

No performance assessed.

3.3.14. Hardened base coat: static modulus of elasticity, tensile strength and elongation at break for products with a thickness up to 5 mm (EAD 040089-00-0404: clause 2.2.3.16)

No performance assessed.

3.3.15. Shear strength and shear modulus of foam adhesive (EAD 040089-00-0404: clause 2.2.3.17)

Table 11.

	Shear strength (kPa)		Shear modulus (kPa)	
	mean	min.	mean	min.
Knauf SPEEDERO	78,4	75,2	525	498

3.3.16. Post expansion behaviour of foam adhesive (EAD 040089-00-0404: clause 2.2.3.18)

Table 12.

	Expansion (mm) after -initial thickness 8 mm-		
	time	mean	max.
Knauf SPEEDERO	5 min	0,80	0,88
	10 min	0,46	0,67
	20 min	0,14	0,22
	40 min	0,12	0,30
	60 min	0,17	0,37
	24 h	0,26	0,40

3.3.17. Tearing strength and elongation of reinforcement: glass fibre mesh (EAD 040089-00-0404: clause 2.2.3.23)

See Annex No 2

3.3.18. Tensile strength of rendering system (EAD 040089-00-0404: clause 2.2.3.12)

No performance assessed.

3.4. Protection against noise (BWR 5)

3.4.1. Airborne sound insulation (EAD 040089-00-0404: clause 2.2.4.1)

No performance assessed.

3.4.2. Dynamic stiffness of insulation product (EAD 040089-00-0404: clause 2.2.4.2)

No performance assessed.

3.5. Energy economy and heat retention (BWR 6)

3.5.1. Thermal resistance of the ETICS (EAD 040089-00-0404: clause 2.2.5.1)

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 : global (corrected) thermal transmittance of the covered wall (W/ (m²·K))

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

χ_p : local influence of thermal bridge caused by an anchor. The values listed below can be taken into account if not specified in the anchor's ETA:

= 0,002 W/K for anchors with a stainless steel screw covered by plastic anchors and for anchors with an air gap at the head of the screw

($\chi_p \cdot n$ negligible for $n < 20$)

= 0,004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ($\chi_p \cdot n$ negligible for $n < 10$)

= negligible for anchors with plastic nails (reinforced or not with glass fibres)

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

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

where:

R_i : thermal resistance of the insulation product (according to declaration in reference to EN 13163) 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 superficial thermal resistance in (m²·K)/W

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

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

3.5.2. Thermal resistance of insulation product (EAD 040089-00-0404: clause 2.2.5.2)

See Annex No 1

3.5.3. Air flow resistance of insulation product (EAD 040089-00-0404: clause 2.2.5.3)

No performance assessed.

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

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

Table 13.

Product(s)	Intended use(s)	Level(s) or class(es) (Reaction to fire)	System(s)
External thermal insulation composite systems/kits (ETICS) with rendering	in external wall subject to fire regulations	A1 ⁽¹⁾ , A2 ⁽¹⁾ , B ⁽¹⁾ , C ⁽¹⁾	1
		A1 ⁽²⁾ , A2 ⁽²⁾ , B ⁽²⁾ , C ⁽²⁾ , D, E, (A1 to E) ⁽³⁾ , F	2+
	in external wall not subject to fire regulations	any	2+

⁽¹⁾ Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

⁽²⁾ Products/materials not covered by footnote ⁽¹⁾

⁽³⁾ Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Classes A1 according to Commission Decision 96/603/EC)

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

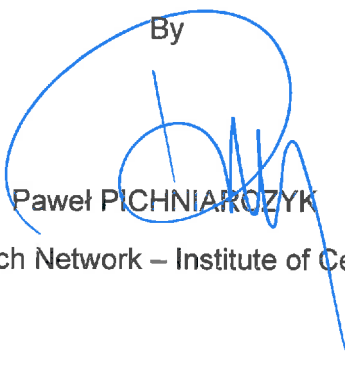
The manufacturer shall perform a permanent internal factory production control based on the Control Plan.

The Control Plan for the manufacturer is specified in clause 3.2 of EAD 040089-00-0404 *ETICS with renderings for the use on timber frame buildings*.

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 26.01.2022

By



Paweł PICHNIAKOZYK

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

Annexes:

Annex No 1 – Insulation products characteristics

Annex No 2 – Glass fibre meshes characteristics

Annex No 1 – Insulation products characteristics

		Boards of expanded polystyrene EPS white or graphite
		Bonded ETICS
Reaction to fire / EN 13501-1		Class – E max. density: 14,0 kg/m ³
Thermal resistance		Defined in the CE marking in reference to EN 13163 (m ² ·K)/W
Thickness / EN 823		± 2 mm [EN 13163 – T(2)]
Length / EN 822		± 2 mm [EN 13163 – L(2)]
Width / EN 822		± 2 mm [EN 13163 – W(2)]
Squareness / EN 824		± 2 mm/m [EN 13163 – S(2)]
Flatness / EN 825		5 mm [EN 13163 – P(5)]
Dimensional stability under specified conditions	EN 1603	± 0,2 % [EN 13163 – DS(N)2]
	EN 1604	1 % [EN 13163 – DS(70,-)1]
Bending strength / EN 12089		≥ 75 kPa [EN 13163 – BS75]
Water vapour permeability, diffusion factor (μ) / EN 12086 – EN 13163		20 to 40
Tensile strength perpendicular to the faces in dry conditions / EN 1607		≥ 80 kPa [EN 13163 – TR80]
Shear strength / EN 12090 – EN 13163		≥ 20 kPa
Shear modulus / EN 12090		≥ 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
Knauf Siatka zbrojąca 165 A	Mass per unit area: 159 g/m ² Mesh size: 3,8 x 3,7 mm	≥ 20	≥ 50
Knauf Siatka zbrojąca 165 B	Mass per unit area: 165 g/m ² Mesh size: 3,7 x 4,4 mm	≥ 20	≥ 50
Knauf Siatka zbrojąca 165 C	Mass per unit area: 160 g/m ² Mesh size: 3,5 x 3,9 mm	≥ 20	≥ 50

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