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Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
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European Technical Assessment

ETA-19/0677
of xx/xx/2021

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 CERAMIC
Product family to which the construction product belongs	Kits for external thermal insulation composite system (ETICS) with panels as thermal insulation product and discontinuous claddings as exterior skin
Manufacturer	KNAUF Sp. z o.o. Światowa 25 02-229 Warszawa, POLAND
Manufacturing plant	KNAUF BAUPRODUKTE POLSKA Sp. z o.o. Gipsowa 5 97-427 Rogowiec, POLAND
This European Technical Assessment contains	19 pages including 2 Annexes which form an integral part of this assessment. Annex No 3 Control Plan contains confidential information and is 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 040287-00-0404

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Specific parts

1. Technical description of the product:

This product KNAUF THERMO CERAMIC is a kit for External Thermal Insulation Composite System (ETICS) with panels as thermal insulation and discontinuous claddings as exterior skin – 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 with supplementary mechanical fixings (minimum bonded surface area – 80%) onto a wall. The method of fixing and the relevant components are specified in Table 1. The insulation product is faced with a base coat consisting of one or more layers (site applied), one of which contains reinforcement and subsequently with exterior skin consisting of adhesive for claddings, cladding elements and grout. The base coat with exterior skin are 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/m²)	Thickness (mm)
	Bonded ETICS with supplementary mechanical fixings. National application documents shall be taken into account.		
Insulation materials with associated methods of fixing	• **Insulation product:** Boards of expanded polystyrene (EPS)[1)] according to EN 13163: **- KNAUF Therm PRO Fasada/Dach/Podłoga EPS 70 λ 38 (TYP EPS 70)** **- KNAUF ETIXX Fasada λ 31 (TYP EPS S)** **- KNAUF Therm PRO Fasada/Dach/Podłoga EPS 80 λ 37 (TYP EPS 80)** **- Knauf Therm Expert Fasada/Dach/Podłoga EPS 80 λ 31 (TYP EPS 80)** *Product characteristics - see Annex No 1*	- - - -	50 to 250 150 to 300 50 to 300 50 to 300
	• **Adhesives:** - **Knauf KZW 700 Klej zbrojony z włóknem** cement based powder requiring addition of 0,26 l/kg of water - **Knauf K 600 Klej do zatapiania siatki** cement based powder requiring addition of 0,24 l/kg of water - **Knauf KS 300 Klej do styropianu** cement based powder requiring addition of 0,25 l/kg of water	about 4,0 (powder) about 4,0 (powder) about 4,0 (powder)	- - -
	• **Supplementary mechanical fixings:** Plastic anchors covered by relevant ETA	-	-
Base coats	• **Knauf KZW 700 Klej zbrojony z włóknem** cement based powder requiring addition of 0,26 l/kg of water • **Knauf K 600 Klej do zatapiania siatki** cement based powder requiring addition of 0,24 l/kg of water	about 4,0 (powder) about 4,0 (powder)	4,0 to 5,0 4,0 to 5,0

[1)] Other boards of self-extinguishing expanded polystyrene (EPS) according to EN 13163 of thickness 50 ÷ 300 mm can be used, introduced on the market, if minimum requirements given in Annex No 1 are met.

Table 1. cont.

	Components	Coverage (kg/m²)	Thickness (mm)
Reinforce-ment	• **Standard glass fibre mesh** - **Knauf Siatka zbrojąca 165 A** - **Knauf Siatka zbrojąca 165 B** - **Knauf Siatka zbrojąca 165 C** *Products characteristics - see Annex No 2*	 - - -	 - - -
Adhesives for claddings	• **Knauf K4 Szary** Cement based powder requiring addition of 0,28 l/kg of water to be used with ceramic tiles • **Knauf K4 Biały** Cement based powder requiring addition of 0,28 l/kg of water to be used with natural stone tiles	3,7 (powder) 3,7 (powder)	5,0 5,0
Claddings	• **Ceramic tiles** according to EN 14411 Water absorption ≤ 6% Frost resistant acc. to EN 10545-12 Tiles area percentage in exterior skin area: 79,7% ÷ 99,6% Maximum area of a tile 0,54 m² with maximum length of a tile's side 0,90 m • **Natural stone tiles** according to EN 1469 Water absorption ≤ 6% Frost resistant acc. to EN 12371 Tiles area percentage in exterior skin area: 97,5% ÷ 99,6% Maximum area of a tile 0,36 m² with maximum length of a tile's side 0,60 m	≤ 40 kg/m² (superficial mass) ≤ 40 kg/m² (superficial mass)	5,0 to 20,0 10,0 to 20,0
Grout	• **Knauf Elastic Plus Fuga elastyczna** cement based powder requiring addition of 0,27 l/kg of water; Joints area percentage in exterior skin area with ceramic tiles: 0,4% ÷ 20,3% Joints area percentage in exterior skin area with natural stone tiles: 0,4% ÷ 2,5 % joint width 2 ÷ 15 mm***	0,3 to 0,8** (powder)	5,0 to 20,0
Ancillary materials	• Key coat **Knauf Universalgrund**, ready to use liquid to be used onto base coat, coverage: about 0,15 kg/m² • Other according to EAD 040287-00-0404 Remain under the manufacturer's responsibility		

**regulated by thickness and joint width of the claddings; ***joint width shall be determined depending on the cladding element dimensions, taking into account the permissible tile to joint area ratio envisaged in the ETICS

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

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones) or concrete (cast on site or as prefabricated panels).

The ETICS can be used on new or existing (retrofit) vertical walls.

The ETICS is made of non load-bearing construction elements. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effect of weathering.

The ETICS is not intended to ensure the airtightness of the building structure.

The provisions made in this European Technical Assessment are based on an assumed working life of the ETICS 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 (EAD 040287-00-0404: clause 2.2.1, EN 13501-1)

Table 2.

Configuration	Max. organic content [%]	Flame retardant content	Euroclass acc. to EN 13501-1
Adhesive	3,0	No flame retardant	B-s1, d0
EPS boards* *density ≤ 13,5 kg/m³*	-		
Base coat**	3,0		
Glass fibre mesh	10,18***		
Adhesive for cladding	5,0		
Cladding	-		
Grout	3,0		

*flame retardant content in quantity ensuring Euroclass E according to EN 13501-1

**configuration for reaction to fire tests included key coat Knauf Universalgrund (PCS: 32,98 MJ/kg)

***max. heat of combustion, MJ/kg

Note: European reference fire scenario has not been laid down for façades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in façades. 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. Façade fire performance (EAD 040287-00-0404: clause 2.2.2)

Table 3.

Country	Assessment method	Performance: class – description
Poland	PN-B-02867:2013	Range of Fire Spreading: **NRO** – non fire spreading

3.2. Hygiene, health and environment (BWR 3)

3.2.1. Water absorption by capillarity (EAD 040287-00-0404: clause 2.2.3)

- Base coat Knauf KZW 700 Klej zbrojony z włóknem:
  - Water absorption after 3 minutes: 0,0 kg/m²;
  - Water absorption after 1 hour: 0,1 kg/m²;
  - Water absorption after 24 hours: 0,4 kg/m².
- Base coat Knauf K 600 Klej do zatapiania siatki:
  - Water absorption after 3 minutes: 0,0 kg/m²;
  - Water absorption after 1 hour: 0,1 kg/m²;
  - Water absorption after 24 hours: 0,4 kg/m².

ETICS with cladding: Table 4.

Table 4.

		Water absorption (kg/m²) after		
		3 minutes	**1 hour**	**24 hours**
ETICS with cladding: Base coat* Knauf KZW 700 Klej zbrojony z włóknem + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,0	0,0	0,4
	Natural stone tiles	0,0	0,1	0,2
ETICS with cladding: Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,0	0,2	0,4
	Natural stone tiles	0,0	0,1	0,2

*configuration for water absorption by capillarity tests included key coat Knauf Universalgrund

3.2.2. Water vapour permeability (resistance to water vapour diffusion) (EAD 040287-00-0404: clause 2.2.4)

Table 5.

		EPS boards thickness (mm)	Water vapour diffusion resistance Z_{ETICS} [$(m^2 \cdot s \cdot Pa)/kg$]	Average equivalent air thickness $S_{d\ ETICS}$ (m)
ETICS with cladding: Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (adhesive for claddings Knauf K4 Szary + Ceramic tiles + grout):	*(max. tile to joint area ratio 0,996 : 0,004)*	50	$1{,}41 \cdot 10^{11}$	28
		100	$1{,}51 \cdot 10^{11}$	30
		150	$1{,}61 \cdot 10^{11}$	32
		200	$1{,}71 \cdot 10^{11}$	34
		250	$1{,}81 \cdot 10^{11}$	36
		300	$1{,}91 \cdot 10^{11}$	38
	(min. tile to joint area ratio 0,797 : 0,203)	50	$1{,}41 \cdot 10^{10}$	2,8
		100	$2{,}41 \cdot 10^{10}$	4,8
		150	$3{,}41 \cdot 10^{10}$	6,8
		200	$4{,}41 \cdot 10^{10}$	8,8
		250	$5{,}41 \cdot 10^{10}$	10,8
		300	$6{,}41 \cdot 10^{10}$	12,8
ETICS with cladding: Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (adhesive for claddings Knauf K4 Biały + Natural stone tiles + grout):	*(max. tile to joint area ratio 0,996 : 0,004)*	50	$1{,}41 \cdot 10^{11}$	28
		100	$1{,}51 \cdot 10^{11}$	30
		150	$1{,}61 \cdot 10^{11}$	32
		200	$1{,}71 \cdot 10^{11}$	34
		250	$1{,}81 \cdot 10^{11}$	36
		300	$1{,}91 \cdot 10^{11}$	38
	(min. tile to joint area ratio 0,975 : 0,025)	50	$2{,}89 \cdot 10^{10}$	6
		100	$3{,}89 \cdot 10^{10}$	8
		150	$4{,}89 \cdot 10^{10}$	10
		200	$5{,}89 \cdot 10^{10}$	12
		250	$6{,}89 \cdot 10^{10}$	14
		300	$7{,}89 \cdot 10^{10}$	16

*configuration for water vapour permeability calculations included key coat Knauf Universalgrund

3.2.3. Accelerated ageing behaviour (EAD 040287-00-0404: clause 2.2.5)

3.2.3.1. Hygrothermal behaviour (EAD 040287-00-0404: clause 2.2.5.1)

Pass (without defects).

Table. 6

		Bond strength after hygrothermal cycles (MPa)		Ratio: bond strength after hygrothermal cycles / bond strength in dry conditions
		Mean value	Min. value	
ETICS with cladding: Base coat* Knauf KZW 700 Klej zbrojony z włóknem + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,13**	0,11	1,08
	Natural stone tiles	0,13**	0,11	1,18
ETICS with cladding: Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,14**	0,12	1,27
	Natural stone tiles	0,13**	0,11	1,18

*configuration for accelerated ageing behaviour tests included key coat Knauf Universalgrund;
**100% cohesive rupture in insulation

3.2.3.2. Freeze-thaw behaviour (EAD 040287-00-0404: clause 2.2.5.2)

ETICS is frost resistant according to water absorption test.

3.3. Safety and accessibility in use (BWR 4)

3.3.1. Impact resistance (EAD 040287-00-0404: clause 2.2.7)

Table 7.

	ETICS with cladding: Base coat* Knauf KZW 700 Klej zbrojony z włóknem + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):		**ETICS with cladding:** Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	
	Ceramic tiles	Natural stone tiles	Ceramic tiles	Natural stone tiles
	Hard body impact			
H1 (1 J)	-	-	-	-
H2 (3 J)	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated
H3 (10 J)	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated
	Soft body impact			
S1 (10 J)	-	-	-	-
S2 (60 J)	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated	Skin not deteriorated
S3 (300 J)	-	Skin not deteriorated	-	Skin not deteriorated
S4 (400 J)	Skin not deteriorated	Skin deteriorated	Skin not deteriorated	Skin deteriorated
	Use category			
	Category I**	Category II**	Category I**	Category II**

*configuration for impact resistance tests included key coat Knauf Universalgrund

**Categories I and II correspond to the degree of exposure in use:

– Category I – ETICS can be used in a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.

– Category II – ETICS can be used in a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.

3.3.2. Bond strength (EAD 040287-00-0404: clause 2.2.8)

3.3.2.1. Bond strength between the base adhesive and the substrate (EAD 040287-00-0404: clause 2.2.8)

Table 8.

	Dry conditions		48 h immersion in water + 2 hours 23°C/50% RH		48 h immersion in water + 7 days 23°C/50% RH	
	Mean value (MPa)	**Min. value (MPa)**	**Mean value (MPa)**	**Min. value (MPa)**	**Mean value (MPa)**	**Min. value (MPa)**
Knauf KZW 700 Klej zbrojony z włóknem	0,81*	0,73	0,47*	0,43	1,04*	0,93
Knauf K 600 Klej do zatapiania siatki	0,91*	0,86	0,57*	0,54	1,22*	1,14
Knauf KS 300 Klej do styropianu	0,88*	0,81	0,54*	0,51	1,17*	1,07

* 100% cohesive rupture in adhesive

3.3.2.2. Bond strength between the insulation panel and the base adhesive (EAD 040287-00-0404: clause 2.2.8)

Table 9.

	Dry conditions		48 h immersion in water + 2 hours 23°C/50% RH		48 h immersion in water + 7 days 23°C/50% RH	
	Mean value (MPa)	**Min. value (MPa)**	**Mean value (MPa)**	**Min. value (MPa)**	**Mean value (MPa)**	**Min. value (MPa)**
Knauf KZW 700 Klej zbrojony z włóknem	0,10*	0,10	0,09*	0,08	0,10*	0,10
Knauf K 600 Klej do zatapiania siatki	0,11*	0,10	0,10*	0,09	0,11*	0,11
Knauf KS 300 Klej do styropianu	0,11*	0,10	0,10*	0,09	0,11*	0,10

* 100% cohesive rupture in insulation

3.3.2.3. Bond strength between external layers and the insulation panel (EAD 040287-00-0404: clause 2.2.8)

Table 10.

		Dry conditions		48 h immersion in water + 2 hours 23°C/50% RH		48 h immersion in water + 7 days 23°C/50% RH	
		Mean value (MPa)	Min. value (MPa)	Mean value (MPa)	Min. value (MPa)	Mean value (MPa)	Min. value (MPa)
ETICS with cladding: Base coat* Knauf KZW 700 Klej zbrojony z włóknem + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,12**	0,11	0,10**	0,08	0,11**	0,10
	Natural stone tiles	0,11**	0,10	0,09**	0,08	0,11**	0,10
ETICS with cladding: Base coat* Knauf K 600 Klej do zatapiania siatki + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Ceramic tiles	0,11**	0,10	0,10**	0,09	0,11**	0,10
	Natural stone tiles	0,11**	0,10	0,09**	0,08	0,11**	0,10

*configuration for bond strength tests included key coat Knauf Universalgrund; **100% cohesive rupture in insulation

3.3.3. Tensile strength of the thermal insulation panel (EAD 040287-00-0404: clause 2.2.9)

See Annex No 1.

3.3.4. Shear strength and shear modulus of the thermal insulation panel (EAD 040287-00-0404: clause 2.2.10)

Tabela 11.

EPS boards*	Dry conditions (kPa)		7 days in 70ºC/95% RH (kPa)		28 days in 70ºC/95% RH (kPa)	
	Shear strength	Shear modulus	Shear strength	Shear modulus	Shear strength	Shear modulus
KNAUF Therm PRO Fasada/Dach/ Podłoga EPS 70 λ 38 (TYP EPS 70)	24	1330	No performance assessed		No performance assessed	
KNAUF ETIXX Fasada λ 31 (TYP EPS S)	28	1000				
KNAUF Therm PRO Fasada/Dach/ Podłoga EPS 80 λ 37 (TYP EPS 80)	24	1030				
Knauf Therm Expert Fasada/Dach/Podłoga EPS 80 λ 31 (TYP EPS 80)	27	1210				

*other EPS boards according to EN 13163, 50 ÷ 300 mm thick, may be used, provided that they meet the properties specified in Annex 1

3.3.5. Dead load behaviour (EAD 040287-00-0404: clause 2.2.11)

Dead load behaviour for configuration of ETICS representing the worst case has been assessed.

Table 12.

		Dead load behaviour	
		Maximum dead load (N)	Displacement (mm)
	Bonded ETICS with supplementary mechanical fixings		
ETICS with cladding Base coat* Knauf KZW 700 Klej zbrojony z włóknem + exterior skin (relevant adhesive for claddings + cladding indicated hereafter + grout):	Natural stone tiles	330	7,6

*configuration for dead load behaviour tests included key coat Knauf Universalgrund

3.4. Protection against noise (BWR 5)

3.4.1. Improvement of airborne sound insulation (EAD 040287-00-0404: clause 2.2.14)

No performance assessed.

3.5. Energy economy and heat retention (BWR 6)

3.5.1. Thermal conductivity and thermal resistance (EAD 040287-00-0404: clause 2.2.15)

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

$$U_c = U + \Delta U$$

where:

U_c: corrected thermal transmittance of the whole external wall, including thermal bridges (W/ (m^2·K));

ΔU: correction term of the thermal transmittance for mechanical fixing devices = $\chi_p \cdot n_{fix}$ (for anchors):

χ_p: point thermal transmittance value of the anchor (W/K) (see EOTA TR025). If not specified in the anchor's ETA, the following values apply:

- = 0,002 W/K for anchors with a plastic screw/nail, stainless steel screw/nail with the head covered by plastic material, and for anchors with an air gap at the head of the screw/nail;
- = 0,004 W/K for anchors with a galvanized steel screw/nail with the head covered by a plastic material;
- = 0,008 W/K for all other anchors (worst case);

n_{fix}: number of anchors per unit area (1/m^2)

U: thermal transmittance of the whole external wall, including ETICS, without thermal bridges (W/ (m^2·K)) determined as follows:

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

where:

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

R_{se}: external surface thermal resistance in (m^2·K)/W

R_{si}: internal surface thermal resistance in (m^2·K)/W

R_{ETICS}: thermal resistance of whole ETICS in (m^2·K)/W:

$$R_{ETICS} = R_{skin} + R_{cladd\text{-}adhesive} + R_{base\_coat} + R_{insulatoin} + R_{base\text{-}adhesive}$$

where:

$$R_{skin} = R_{cladding} \cdot P_{cladding} + R_{grout} + P_{jointt}$$

and

$P_{cladding}$ = percentage surface of cladding element (%)
P_{joint} = percentage surface of joints (%)

Table 13.

Component	Thermal conductivity (tabulated value acc. to harmonized standard)		Harmonized standard with given tabulated value of thermal conductivity
	Min. value (W/m·K)	Max. value (W/m·K)	
Base adhesive	0,54	1,28	EN 1745
Insulation	0,037*	0,045	EN 13162
Base coat	0,54	0,54	EN 1745
Adhesive for claddings	0,54	0,54	EN 1745
Ceramic tiles	1,30	1,30	EN 10456
Natural stone tiles	0,85	3,5	EN 10456
Grout	1,28	1,28	EN 1745

*assumpted value

General equation for thermal resistance of each material of the wall:

$$R = \frac{d}{\lambda}$$

where:

d: thickness of the material (m)

λ: thermal conductivity of the material [(m·K)/W]

Table 14.

		Thermal resistance R_{ETICS} with minimum thickness of EPS [(m²·K)/W]		Thermal resistance R_{ETICS} with maximum thickness of EPS [(m²·K)/W]	
		At minimum: value of thermal resistance and thickness of application of components	At maximum: value of thermal resistance and thickness of application of components	At minimum: value of thermal resistance and thickness of application of components	At maximum: value of thermal resistance and thickness of application of components
ETICS with cladding: Base coat* Knauf KZW 700 Klej zbrojony z włóknem or Knauf K 600 Klej do zatapiania siatki + exterior skin (adhesive for claddings Knauf K4 Biały or Knauf K4 Szary + cladding indicated hereafter + grout):	Ceramic tiles	1,144	1,161	8,141	8,158
	Natural stone tiles	1,143	1,169	8,140	8,166

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.

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 system **2+** (further described in Annex V to Regulation (EU) No 305/2011) applies.

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 040287-00-0404 *Kits for external thermal insulation composite system (ETICS) with panels as thermal insulation product and discontinuous claddings as exterior skin*.
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 xx.xx.2021

By

Paweł PICHNIARCZYK

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*		
1) KNAUF Therm PRO Fasada/Dach/Podłoga EPS 70 λ 38 (TYP EPS 70) EPS – EN 13163 – T(1) – L(2) – W(2) – S(2) – P(5) – BS115 – CS(10)70 – DS(N)2 – DS(70,-)1 – TR100 **2) KNAUF ETIXX Fasada λ 31 (TYP EPS S)** EPS – EN 13163 – T(2) – L(2) – W(2) – S(5) – P(5) – BS100 – DS(N)5 – DS(70,-)2 – TR100 **3) KNAUF Therm PRO Fasada/Dach/Podłoga EPS 80 λ 37 (TYP EPS 80)** EPS – EN 13163 – T(1) – L(2) – W(2) – S(2) – P(5) – BS125 – CS(10)80 – DS(N)2 – DS(70,-)1 – TR100 **4) Knauf Therm Expert Fasada/Dach/Podłoga EPS 80 λ 31 (TYP EPS 80)** EPS – EN 13163 – T(2) – L(2) – W(2) – S(5) – P(5) – BS125 – CS(10)80 – DS(N)5 – DS(70,-)1 – TR100		
Reaction to fire / EN 13501-1		Euroclass – E max. density: 13,5 kg/m^3
Thermal resistance		Defined in the CE marking in reference to EN 13163 (m^2·K)/W
Thermal conductivity (λ_D) / EN 12667 / EN 12939		≤ 0,045 W/(m · K)
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		± 5 mm/m [EN 13163 – S(5)]
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	2 % [EN 13163 – DS(70,-)2]
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 – EN 13163		≥ 1000 kPa

*Other boards of self-extingushing expanded polystyrene (EPS) according to EN 13163 of thickness 50 ÷ 300 mm can be used, introduced on the market, if properties according to designation codes of EPS products or minimum requirements given in table in Annex No 1 are met.

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