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European Technical Assessment

ETA 18/0422
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I General Part

Technical Assessment Body issuing the ETA:

Technical and Test Institute for Construction Prague

Trade name of the construction product

Akrys 3000 S

Product family to which the construction product belongs

Product area code: 4
External Thermal Insulation Composite Systems (ETICS) with rendering insulation product - expanded polystyrene (EPS)

Manufacturer

PPG Deco Polska Sp. z o.o.
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Manufacturing plant

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This European Technical Assessment contains

16 pages including 3 Annexes which form an integral part of this Assessment.

Annex No. 4 Control Plan contains confidential information and is not included in the European Technical Assessment when that assessment is publicly disseminated.

This European Technical Assessment is issued in accordance with regulation (EU) No. 305/2011 on the basis of

ETAG 004 used as European Assessment Document (EAD)

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II Specific part

1 Technical description of the product

1.1 Definition and composition of the kit

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

The ETICS kit comprises a prefabricated insulation product of expanded polystyrene (EPS) to be bonded or mechanically fixed onto a wall. The methods of fixing and the relevant components are specified in the table below. The insulation product is faced with a rendering system consisting of one or more layers (site applied), one of which contains reinforcement. The rendering system 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 ...) to treat details of ETICS (connections, 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.

Composition of the ETICS

Table No. 1

	Components	Coverage (kg/m ²)	Thickness (mm)
Insulation products with associated methods of fixing	Bonded ETICS (fully or partially bonded) with or without supplementary anchors. National application documents shall be taken into account.		
	<ul style="list-style-type: none"> • Insulation product: EPS according to EN 13163 see Annex No. 1 for product characteristics 	/	50 to 250
	<ul style="list-style-type: none"> • Adhesives: min. bonded surface: 40 % - Akrys 3000 Klej PS (cement based powder requiring addition of water 0.18 l/kg) - Akrys 3000 Klej ZS cement based powder requiring addition of water 0.20 l/kg 	3.5 to 4.5 (dry matter)	/

	Components	Coverage (kg/m ²)	Thickness (mm)
Insulation products with associated methods of fixing	<p>Mechanically fixed ETICS with anchors and supplementary adhesive (see Cl. 3.3.5 and Annex No. 2 for possible associations EPS/anchors)</p> <p>National application documents shall be taken into account.</p>		
	<ul style="list-style-type: none"> Insulation product: EPS according to EN 13163 see Annex No. 1 for product characteristics 	/	50 - 250
	<ul style="list-style-type: none"> Supplementary adhesives: <ul style="list-style-type: none"> min. bonded surface: 40 % - Akrys 3000 Klej PS - (cement based powder requiring addition of water 0.19 l/kg) - Akrys 3000 Klej ZS - cement based powder requiring addition of water 0.20 l/kg 	3.5 to 4.5 (dry matter)	/
	<ul style="list-style-type: none"> Anchors see Annex No. 2 for individual product characteristics. In addition to the following list. Other anchors can be used provided that they comply with the requirements introduced in the Annex No. 2. 		
	<ul style="list-style-type: none"> - ejothem STR U - ejothem STR U 2G plastic screw-in anchors - KOELNER TFIX-8P plastic nailed-in anchors - termoz SV II ecotwist plastic screw-in anchors 	ETA-04/0023 ETA-13/0845 ETA-12/0208	
Base coat	<ul style="list-style-type: none"> Akrys 3000 Klej ZS cement based powder requiring addition of water 0.20 l/kg 	5.2 (dry matter)	4.0
Reinforcement	<ul style="list-style-type: none"> Standard mesh applied in single layer see 0 for product characteristics: <ul style="list-style-type: none"> - Siatka 155g ST-2924 - Siatka 170g ST-112 	/	/
Key coat	<ul style="list-style-type: none"> - Akrys 3000 P - for all finishing coats - pigmented ready to use liquid - Akrys 3000 Silikat Podklad - for silicate finishing coats - pigmented ready to use liquid 	0.3 – 0.5	0.1 – 0.2

	Components	Coverage (kg/m ²)	Thickness (mm)
Finishing coats	<ul style="list-style-type: none"> • Ready to use paste - acrylic binder: <ul style="list-style-type: none"> - Akrys 3000 Akryl - grain structure (particle size 1.5; 2.0 mm) - ribbed structure (particle size 1.5; 2.0; 2.5 mm) - Tynk Mozaikowy - grain structure (particle size 1.0; 1.5 mm) 	2.2 - 3.5	Regulated by particle size
	<ul style="list-style-type: none"> • Ready to use paste - silicate binder: <ul style="list-style-type: none"> - Akrys 3000 Sillikat - grain structure (particle size 1.5 mm) 	2.2 – 2.7	Regulated by particle size
	<ul style="list-style-type: none"> • Ready to use paste - silicone binder: <ul style="list-style-type: none"> - Akrys 3000 Sillikon - grain structure (grain size 1.5 mm) 	2.2 – 2.7	Regulated by particle size
	<ul style="list-style-type: none"> • Ready to use paste – silicone-silicate binder: <ul style="list-style-type: none"> - Akrys 3000 S-S - grain structure (grain size 0,8 (Freestyle) ; 1.5; 2.0 mm) 	2.2 – 3.5	Regulated by particle size
	<ul style="list-style-type: none"> • Mineral coats <ul style="list-style-type: none"> - Akrys 3000 Mineral - cement based powder requiring addition of water 100 : (20+22) - grain structure (grain size 1.5; 2.0 mm) 	2.5 – 3.0	Regulated by particle size
	<ul style="list-style-type: none"> • Ready to use paste - silicone binder: <ul style="list-style-type: none"> - Akrys 3000 S-Bio - grain structure (grain size 1.5; 2.0 mm) 	2.2 – 3.5	Regulated by particle size
Paints	Silicone paints <ul style="list-style-type: none"> - Farba silikonowa 	/	/
Ancillary materials	Remain under the manufacturer's responsibility		

2 Specification of the intended use(s) 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 characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classification and for fixing of the ETICS either by bonding or mechanically. The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation.

The ETICS is made of non-loadbearing 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 can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

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

The choice of the method of fixing depends on the characteristics of the substrate, which may need preparation (see cl. 7.2.1 of the ETAG 004) and shall be done in accordance with the national instructions.

The ETICS belong to Category SW2, according to EOTA Technical Report No 034.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of Akrys 3000 S at least 25 years and other repairable or replaceable products and materials, provided that the conditions laid down in this ETA are met.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are regarded only as a mean for choosing the right products in relation to the expected economically reasonable working life of the works.

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 1 - 3.

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire (ETAG 004 - clause 5.1.2.1, EN 13501-1)

Table No. 2

Configuration	Heat of combustion	Flame retardant content	Euroclass according to EN 13501-1
Adhesive	Max 0.00 MJ/kg	No flame retardant	B-s2, d0
Boards of expanded polystyrene EPS Maximal density of 15.7 kg/m ³	/	In quantity ensuring Euroclass E according to EN 13501-1	
Base coat render min. thickness 4 mm	Max 0.00 MJ/kg	No flame retardant	
Key coat	Max 3.62 MJ/kg	No flame retardant	
Glass fibre mesh	Max 6.09 MJ/kg	No flame retardant	
Finishing coats with: acrylic silicate silicone silicone-silicate binders	Max 2.67 MJ/kg	No flame retardant	
If Tynk Mozaikowy is used If Akryls 3000 S-S Freestyle is used If Farba silikonowa is used If Siatka 174g ST-112 is used			No performance assessed

Note: A 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 (e.g. on the basis of a large scale test) might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

3.2 Hygiene, health and environment (BWR 3)

3.2.1 Water absorption (ETAG 004 - clause 5.1.3.1)

- Base coat Akrys 3000 Klej ZS:

Water absorption after 1 hour < 1 kg/m²

Water absorption after 24 hours < 0.5 kg/m²

- Rendering system:

Table No. 3

		Water absorption after 24 hours	
		< 0.5 kg/m ²	≥ 0.5 kg/m ²
Rendering system: Base coat Akrys 3000 Klej ZS + finishing coats as indicated here:	Akrys 3000 Akryl	X	
	Tynk Mozaikowy	X	
	Akrys 3000 Silikat	X	
	Akrys 3000 Freestyle	X	
	Akrys 3000 Silikon	X	
	Akrys 3000 S-S	X	
	Akrys 3000 Mineral		X
	Akrys 3000 S-Bio	X	

3.2.2 Watertightness (ETAG 004 - clause 5.1.3.2)

3.2.2.1 Hygrothermal behaviour

Pass (without defects).

3.2.2.2 Freeze-thaw behaviour

Freeze-thaw resistant - according to the water absorption test result.

3.2.3 Impact resistance (ETAG 004 - clause 5.1.3.3)

Table No. 4

Render coating: base coat Akrys 3000 Klej ZS + reinforcement and finishing coats listed hereafter:	Single standard mesh
Akrys 3000 Akryl	Category III
Tynk Mozaikowy	Category I
Akrys 3000 Silikat	Category II
Akrys 3000 Freestyle	
Akrys 3000 Silikon	Category II
Akrys 3000 S-S	Category II
Akrys 3000 Mineral	Category III
Akrys 3000 S-Bio	Category II

3.2.4 Water vapour permeability (ETAG 004 - clause 5.1.3.4)

Table No. 5

Rendering system: base coat Akrys 3000 Klej ZS + reinforcement and finishing coats indicated hereafter	Equivalent air layer thickness s_d
	Single standard mesh
Akrys 3000 Akryl	≤ 0.18 m
Tynk Mozaikowy	≤ 0.21 m
Akrys 3000 Silikat	≤ 0.11 m
Akrys 3000 Freestyle	
Akrys 3000 Silikon	≤ 0.19 m
Akrys 3000 S-S	≤ 0.18 m
Akrys 3000 Mineral	≤ 0.13 m
Akrys 3000 S-Bio	≤ 0.18 m

3.2.5 Release of dangerous substances (ETAG 004 - clause 5.1.3.5, EOTA TR034)

Kit not assessed according to EOTA TR 034.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Bond strength between base coat and insulation product (ETAG 004 - clause 5.1.4.1.1)

- Initial state: bond strength ≥ 0.011 MPa and a cohesive failure in the insulation product
- After hygrothermal cycles: bond strength ≥ 0.09 MPa and cohesive failure in the insulation product
- After freeze-thaw cycles: test not required (see Cl. 3.2.1 of this ETA)

3.3.2 Bond strength between adhesive and substrate / insulation product (ETAG 004 - clauses 5.1.4.1.2, 5.1.4.1.3)

Table No. 6

		Initial state	48 hrs. immersion in water + 2 hrs. 23°C/50% RH	48 hrs. immersion in water + 7 days 23°C/50% RH
Akryz 3000 Klej PS Akryz 3000 Klej ZS	Concrete	≥ 0.25 MPa	≥ 0.08 MPa	≥ 0.25 MPa
	Expanded polystyrene (EPS)	≥ 0.08 MPa	≥ 0.03 MPa	≥ 0.08 MPa

3.3.3 Bond strength after ageing (ETAG 004 - clauses 5.1.7.1)

- After ageing by hygrothermal cycles: bond strength ≥ 0.09 MPa and cohesive failure in the insulation product
- After 7 days of immersion in water and 7 days of drying : ≥ 0.12 MPa and cohesive failure in insulation product
- After freeze-thaw cycles: test not required (see Cl. 3.2.2.2 of this ETA)

3.3.4 Fixing strength (ETAG 004 - clause 5.1.4.2)

Test not required (no limitation of ETICS length).

3.3.5 Wind load resistance (ETAG 004 - clause 5.1.4.3)

Table No. 7

Anchor description	Trade name		See Annex No. 2		KOELNER TFIX-8P + additional plate KWL 140 (ETA-13/0845)	fischer termoz SV II ecotwist (ETA-12/0208)
	Assembly:		Surface assembly	Countersunk assembly	Surface assembly	Special assembly
	Plate diameter (mm)		60 or more	60 or more	140	60
EPS characteristics	Thickness (mm)		≥ 50	≥ 100	≥ 50	≥ 100
	Tensile strength perpendicular to faces (kPa)		≥ 100	≥ 100	≥ 100	≥ 100
Maximal load	Anchors placed at the body of the insulation product	R_{panel}	min. value: 0.58 kN mean value: 0.61 kN	min. value: 0.86 kN mean value: 0.93 kN	min. value: 0.49 kN mean value: 0.53 kN	
	Anchors placed at joints of the insulation product	R_{joint}	min. value: 0.53 kN mean value: 0.47 kN	min. value: 0.61 kN mean value: 0.65 kN	min. value: 0.44 kN mean value: 0.48 kN	

3.3.6 Render strip tensile test

No performance assessed.

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation

No performance assessed.

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal resistance

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

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

Where:

- $\chi_p \times n$ 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
($\chi_p \times n$ negligible for $n < 20$)
 - = 0.004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material
($\chi_p \times n$ 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:

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

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 rendering system (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 of the building (concrete, brick ...) 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.

3.6 Sustainable use of natural resources (BWR 7)

No performance assessed.

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

According to decision 97/556/EC¹, amended by decision 2001/596/EC² of the European Commission the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011 and Commission delegated Regulation (EU) No 568/2014) given in the following table applies:

Table No. 8

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)

¹ 1997/556/EC - Commission Decision of 14 July 1997, published in the Official Journal of the European Communities, L 229/14 of 20/08/1997

² 2001/596/EC - Commission Decision of 8 January 2001, published in the Official Journal of the European Communities, L 209/33 of 02/08/2001

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at the Technický a zkušební ústav stavební Praha, s.p.

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By

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Head of the TAB



Annexes:

- Annex No. 1 Insulation product characteristics**
- Annex No. 2 Anchors, description of individual product characteristics contained in the ETA**
- Annex No. 3 Description of glass fibre mesh**

Annex No. 1 Insulation product characteristics

Description and characteristics		Regulation	Declared characteristics of EPS boards	
			Class, level according to EN 13163	Value
Reaction to fire		EN 13501	E	Apparent density $\leq 15.7 \text{ kg/m}^3$
Thermal resistance		EN 12667	Defined in CE mark in accordance with EN 13163	
Thickness		EN 823	T(1)	$\pm 1 \text{ mm}$
Length		EN 822	L(2)	$\pm 2 \text{ mm}$
Width			W(2)	$\pm 2 \text{ mm}$
Squareness		EN 824	S(5)	$\pm 5 \text{ mm/m}$
Flatness		EN 825	P(5)	5 mm
Surface		ETAG 004	Cut surface (homogenous, without coating)	
Dimensional stability	Under defined temperature and humidity conditions	EN 1604	DS(70,-)1	1%
			DS(70,90)1	1%
	Under constant laboratory conditions	EN 1603	DS(N)2	0.2%
Short term water absorption at partial immersion		EN 1609	---	$< 1 \text{ kg/m}^2$
Diffusion factor (μ)		EN 13163	MU 20 – 40 MU 30 – 70	20 - 70
Tensile strength perpendicular to the faces of insulation product		EN 1607	TR100	$\geq 100 \text{ kPa}$
Shear strength		EN 12090	SS20	$\geq 20 \text{ kPa}$
Shear modulus of elasticity			GM1000	$\geq 1000 \text{ kPa}$

Note: Classes and levels for individual characteristics comply with ČSN EN 13163+A1:2015.

Reaction to fire E has to be proved for every insulation product also at 10 mm products thickness.

Annex No. 2 Anchors, description of individual product characteristics contained in the ETA

Trade name	Plate diameter (mm)	Characteristic pull-out resistance	Plate stiffness (kN/mm)	Load at plate rupture (kN)
Surface assembly				
KOELNER TFIX-8P - RAWLPLUG S.A. - possible additional plate: KWL 140 KWL 110 KWL 090	60	See ETA-13/0845	0.30	1.38
Ejotherm STR U, STR U 2G EJOT Baubefestigungen GmbH - possible additional plates: SBL 140 plus VT 90	60	See ETA-04/0023	0.60	2.08
Countersunk assembly				
Ejotherm STR U, STR U 2G - EJOT Baubefestigungen GmbH	60	See ETA-04/0023	0.60	2.08
Special assembly				
termoz SV II ecotwist - fischerwerke GmbH & Co. KG	60	See ETA - 12/0208	0.96	1.90

In addition to this list, anchors assessed in accordance with ETAG 014 can be used provided that such anchors meet the following requirements:

	Requirements	
Plate diameter	≥ 60 mm	
Plate stiffness	Surface assembly:	≥ 0.3 kN/mm
	Countersunk assembly:	≥ 0.3 kN/mm
Rupture force of anchor's plate	≥ Higher of figures R_{panel} and R_{joint} in relevant table in Cl. 3.3.5	

Annex No. 3 Description of glass fibre mesh

	Description	Strength after ageing	
	Standard fibre mesh applied in one or two layers with aperture size	Absolute strength after ageing (N/mm)	Relative residual strength after ageing, of the strength in the as-delivered state (%)
Siatka 155g ST-2924	4.77 × 3.68 mm	≥ 20	≥ 50
Siatka 170g ST-112	4.06 × 3.71 mm		