INSTYTUT TECHNIKI BUDOWLANEJ

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European Technical Assessment

ETA-16/0933 of 30/09/2024

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	ATLAS GRAWIS
Product family to which the construction product belongs	External Thermal Insulation Composite System (ETICS) with rendering
Manufacturer	ATLAS spółka z o.o. ul. Jana Kilińskiego 2 91-421 Łódź, Poland
Manufacturing plant	ATLAS spółka z o.o. ul. Jana Kilińskiego 2 91-421 Łódź, Poland
This European Technical Assessment contains	20 pages including 3 Annexes which form an integral part of this Assessment
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	European Assessment Document (EAD) 040083-00-0404 “External thermal insulation composite systems (ETICS) with renderings”
This version replaces	ETA-16/0933 issued on 30/12/2016

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Specific Part

1 Technical description of the product

External Thermal Insulation Composite System with rendering ATLAS GRAWIS called ETICS in the following text is a kit comprising components which are factory-produced by the manufacturer or purchased by the ETICS manufacturer from suppliers. ETICS is made up on site from these components. The ETICS manufacturer is ultimately responsible for all components of the ETICS kit specified in this ETA.

The ETICS comprises a factory-made thermal insulation product made of expanded polystyrene (EPS) to be bonded onto a wall. The methods of fixing and the ETICS composition are specified in Table 1.

The thermal insulation product is faced with a rendering system consisting of several layers (site applied), one of which contains reinforcement. The rendering system is applied directly to the insulating panels, without any air gap or disconnecting layer.

Table 1

	Components	Coverage (kg/m²)	Thickness (mm)
Thermal insulation products with methods of fixing	**Bonded ETICS:** fully bonded or partially bonded (bonded surface shall be at least 40%). National application documents shall be taken into account.		
	• **Insulation product:** Expanded polystyrene (EPS) according to EN 13163; see Annex B – thermal insulation product characteristics	-	≤ 250
	• **Adhesives:** **ATLAS GRAWIS S** cement based powder requiring addition of 0,22 to 0,24 l/kg of water	4,0 to 5,0 (1) (powder)	-
	ATLAS GRAWIS U cement based powder requiring addition of 0,21 to 0,23 l/kg of water	4,0 to 5,0 (1) (powder)	-
Base coat	• **ATLAS GRAWIS U** cement based powder requiring addition of 0,21 to 0,23 l/kg of water	3,0 to 3,5 (powder)	2,0 to 3,5
Glass fibre meshes	• **Standard glass fibre meshes:** see Annex C – glass fibre mesh characteristics	-	-
Key coats	• **ATLAS CERPLAST** composition: water, styrene-acrylic binder, mineral fillers, additives; ready to use liquid to be used with ATLAS CERMIT mineral and Tynk akrylowy ATLAS	0,25 to 0,35	-
	• **ATLAS SILKAT ASX** composition: water, styrene-acrylic binder, silicone resin, additives; ready to use liquid to be used with ATLAS SILKAT and Tynk silikatowy ATLAS	0,25 to 0,35	-
	• **ATLAS SILKON ANX** composition: water, styrene-acrylic binder, silicone resin, mineral fillers, additives; ready to use liquid to be used with ATLAS SILKON, Tynk akrylowo-silikatowy ATLAS, Tynk silikonowy ATLAS, Tynk silikonowy IN ATLAS and Tynk silikonowo-silikatowy ATLAS	0,25 to 0,35	-

(1) refers to fully bonded system

Table 1

	Components	Coverage (kg/m²)	Thickness (mm)
Finishing coats	• **Mineral finishing coats** composition: sand, cement, mineral fillers, additives powder requiring addition of water		
	ATLAS CERMIT SN mineral powder requiring addition of 0,18 to 0,26 l/kg of water; particle size 1,5; 2,0; 2,5; 3,0 mm; floated structure	2,5 to 4,5	regulated by particle size
	ATLAS CERMIT DR mineral powder requiring addition of 0,18 to 0,26 l/kg of water; particle size 2,0; 3,0 mm; ribbed structure	2,5 to 4,5	
	• **Acrylic finishing coat** composition: sand, acryl-copolymer binder, mineral fillers, additives ready to use paste		
	Tynk akrylowy ATLAS particle size: 1,5; 2,0 mm; floated structure	2,5 to 3,5	regulated by particle size
	• **Acrylic-silicone and silicone finishing coats** composition: sand, acryl-copolymer binder, silicone resin, mineral fillers, additives ready to use paste		
	Tynk akrylowo-silikonowy ATLAS particle size: 1,5; 2,0 mm; floated structure	2,5 to 3,5	regulated by particle size
	Tynk silikonowy IN ATLAS particle size: 1,5; 2,0 mm; floated structure	2,5 to 3,5	
	Tynk silikonowy ATLAS particle size: 1,5; 2,0 mm; floated structure	2,5 to 3,5	
	• **Silicone-silicate finishing coats** composition: sand, silicate binder, silicone resin, mineral fillers, additives ready to use paste		
	Tynk silikonowo-silikatowy ATLAS particle size: 1,5; 2,0 mm; floated structure	2,5 to 3,5	regulated by particle size
Primers	• **ATLAS ARKOL SX** composition: water, styrene-acrylic binder, mineral fillers, silicone emulsion, additives ready to use liquid to be used with ATLAS ARKOL S / SALTA S	0,05 to 0,20	-
	• **ATLAS ARKOL NX** composition: water, styrene-acrylic binder, mineral fillers, silicone emulsion, additives ready to use liquid to be used with ATLAS ARKOL N, ATLAS FASTEL NOVA / SALTA and ATLAS SALTA N	0,05 to 0,20	-
Decorative coats (paints)	• **ATLAS ARKOL E** to be used optionally with all finishing coats composition: acrylic binder, pigments, additives ready to use liquid	0,125 to 0,25 (2)	-
	• **ATLAS ARKOL S / SALTA S** to be used optionally with all finishing coats composition: silicate binder, pigments, additives ready to use liquid	0,20 to 0,28 (2)	-

Table 1

	Components	Coverage (kg/m²)	Thickness (mm)
Decorative coats (paints)	• **ATLAS ARKOL N** to be used optionally with all finishing coats composition: silicone resin, pigments, additives ready to use liquid	0,125 to 0,25 (2)	-
	• **ATLAS FASTEL NOVA / SALTA** to be used optionally with all finishing coats composition: silicone resin, pigments, additives ready to use liquid	0,125 to 0,25 (2)	-
	• **ATLAS SALTA E** to be used optionally with mineral and acrylic finishing coats composition: acrylic binder, pigments, additives ready to use liquid	0,125 to 0,25 (2)	-
	• **ATLAS SALTA N** to be used optionally with all finishing coats composition: silicone resin, pigments, additives ready to use liquid	0,125 to 0,25 (2)	-
Ancillary materials	Remain under the ETICS manufacturer responsibility. ETICS is supported with ancillary materials which are defined in EAD 040083-00-0404, clause 1.3.13.		

(2) decorative coats coverage in dm^3/m^2

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

This ETICS is intended to be used as external thermal insulation applied on the walls of buildings. The walls are made of masonry (bricks, blocks, stones, etc.) or concrete (cast on site or as prefabricated panels) with or without rendering.

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

The ETICS gives the building wall to which it is applied additional thermal insulation and protection from effects of weathering.

The ETICS are non-load-bearing construction elements. They do not contribute directly to the stability of the wall on which they are installed.

The ETICS is not intended to ensure the air tightness 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 conditions for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer 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 product.

The information concerning packaging, transport, storage, maintenance and repair shall be given in the manufacturer's technical documentation.

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

Performance of the ETICS related to the Basic Requirements is given in Table 2.

Table 2

No	Essential characteristic	Assessment method (EAD clause)	Performance
Safety in case of fire (BWR 2)			
1	Reaction to fire:	2.2.1	-
	– reaction to fire of ETICS	2.2.1.1	Annex A1
	– reaction to fire of the thermal insulation product	2.2.1.2	no performance assessed (see Annex B for thermal insulation product characteristics)
2	Façade fire performance	2.2.2	no performance assessed
Hygiene, health and the environment (BWR 3)			
3	Content, emission and/or release of dangerous substances – leachable substances	2.2.4	no performance assessed
4	Water absorption:	2.2.5	-
	– of the base coat and the rendering system	2.2.5.1	Annex A2
	– of the thermal insulation product	2.2.5.2	no performance assessed (see Annex B for thermal insulation product characteristics)
5	Water-tightness of the ETICS: Hygrothermal behaviour	2.2.6	Annex A3
6	Water-tightness: Freeze-thaw performance	2.2.7	Annex A3
7	Impact resistance	2.2.8	Annex A4
8	Water vapour permeability:	2.2.9	-
	– of the rendering system (equivalent air thickness s_d)	2.2.9.1	Annex A5
	– of thermal insulation product (water-vapour resistance factor)	2.2.9.2	no performance assessed (see Annex B for thermal insulation product characteristics)
Safety and accessibility in use (BWR 4)			
9	Bond strength:	2.2.11	-
	– bond strength between the base coat and the thermal insulation product (mortar or paste)	2.2.11.1	Annex A6
	– bond strength between the adhesive and the substrate	2.2.11.2	Annex A6
	– bond strength between the adhesive and the thermal insulation product	2.2.11.3	Annex A6
10	Fixing strength (transverse displacement test)	2.2.12	test not required because the ETICS fulfils the criteria $E \cdot d \leq 50.000$ N/mm
11	Wind load resistance of ETICS:	2.2.13	-
	– pull-through tests of fixings	2.2.13.1	no performance assessed
	– static foam block test	2.2.13.2	no performance assessed
	– dynamic wind uplift test	2.2.13.3	no performance assessed
12	Tensile test perpendicular to the faces of the thermal insulation product:	2.2.14	-
	– in dry conditions	2.2.14.1	no performance assessed (see Annex B for thermal insulation product characteristics)
	– in wet conditions	2.2.14.2	no performance assessed

Table 2

No	Essential characteristic	Assessment method (EAD clause)	Performance
13	Shear strength and shear modulus of elasticity test of ETICS	2.2.15	no performance assessed (see Annex B for thermal insulation product characteristics)
14	Render strip tensile test	2.2.17	no performance assessed
15	Bond strength after ageing:	2.2.20	-
	– bond strength after ageing of finishing coat tested on the rig	2.2.20.1	Annex A7
	– bond strength after ageing of finishing coat not tested on the rig	2.2.20.2	no performance assessed
16	Mechanical and physical characteristics of the mesh:	2.2.21	-
	Tensile strength of the glass fibre mesh	2.2.21.1	no performance assessed (see Annex C for glass fibre mesh characteristics)
Protection against noise (BWR 5)			
17	Airborne sound insulation of ETICS	2.2.22.1	no performance assessed
18	Dynamic stiffness of the thermal insulation product	2.2.22.2	no performance assessed
19	Air flow resistance of the thermal insulation product	2.2.22.3	no performance assessed
Energy economy and heat retention (BWR 6)			
20	Thermal resistance and thermal transmittance of ETICS	2.2.23	Annex A8

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

According to Decision 97/556/EC of the European Commission amended by the Decision 2001/596/EC, the systems of assessment and verification of constancy of performance (see Annex V to regulation (EU) No 305/2011) given in Table 3 apply.

Table 3

Product	Intended use	Level or class (Reaction to fire)	System
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 Class A1 according to Commission Decision 96/603/EC)

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited in Instytut Techniki Budowlanej.

For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

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Deputy Director of ITB

Table A1

Configurations	Maximum declared organic content	Declared flame retardant content	Reaction to fire class according to EN 13501-1
ETICS ATLAS GRAWIS: • Adhesives: ATLAS GRAWIS S, ATLAS GRAWIS U	1,9%	0% (no flame retardant)	**C – s2, d0**
• EPS panels: Class E according to EN 13501-1	-		
• Glass fibre meshes: ATLAS 150, ATLAS 165, SSA 1363-145, R 117 A 101 / AKE 145 / VERTEX 145	-		
• Base coat: ATLAS GRAWIS U	1,9%		
• Key coats: ATLAS CERPLAST, ATLAS SILKAT ASX, ATLAS SILKON ANX	15,55%		
• Finishing coats: ATLAS CERMIT SN mineral, ATLAS CERMIT DR mineral, Tynk akrylowy ATLAS, Tynk akrylowo-silikonowy ATLAS, Tynk silikonowy ATLAS, Tynk silikonowy IN ATLAS, Tynk silikonowo-silikatowy ATLAS	10,57%		
• Decorative coats: ATLAS ARKOL S/SALTA S, ATLAS ARKOL N, ATLAS ARKOL E, ATLAS FASTEL NOVA/SALTA, ATLAS SALTA N, ATLAS SALTA E (with relevant primers ATLAS ARKOL NX, ATLAS ARKOL SX)	22,7%		

Table A2.1

Water absorption of the reinforced base coat	After 1 hour (kg/m^2)	After 24 hours (kg/m^2)
ATLAS GRAWIS U	0,064	0,296

Table A2.2

Water absorption of the complete rendering		After 1 hour (kg/m^2)	After 24 hours (kg/m^2)
Rendering system: base coat: **ATLAS GRAWIS U** + key coat + finishing coats indicated hereafter:	ATLAS CERMIT SN mineral ATLAS CERMIT DR mineral	0,055	0,382
	Tynk akrylowy ATLAS	0,024	0,139
	Tynk akrylowo-silikonowy ATLAS	0,035	0,176
	Tynk silikonowy IN ATLAS	0,035	0,176
	Tynk silikonowy ATLAS	0,011	0,143
	Tynk silikonowo-silikatowy ATLAS	0,035	0,286

Table A3.1

Water-tightness of the ETICS: Hygrothermal behavior
The ETICS is assessed resistant to hygrothermal cycles on a rig. ETICS passed the test without defects. **Resistant to hygrothermal cycles.**

Table A3.2

Water-tightness of the ETICS: Freeze-thaw performance
The ETICS with the base coat **ATLAS GRAWIS U,** the key-coats and **all finishing coats** according to Table 1 is assessed freeze-thaw resistant because of the water absorption of base coat and the rendering system is less than 0,5 kg/m² after 24 hours.

Table A4

Impact resistance				
ETICS after hygrothermal cycles on the rig				
ETICS with TR 100 EPS panels according to Annex B and standard mesh (single layer)		**Cracks**	**Max. crack diameter (mm)**	**Impact resistance category**
Rendering system: base coat **ATLAS GRAWIS U** + key-coat + finishing coats indicated hereafter:	Tynk akrylowy ATLAS	Yes – 3 J Yes – 10 J	52,0 65,0	III
	Tynk akrylowo-silikonowy ATLAS	Yes – 3 J Yes – 10 J	45,0 55,0	III
	Tynk silikonowy IN ATLAS	Yes – 3 J Yes – 10 J	45,0 55,0	III
	Tynk silikonowy ATLAS	Yes – 3 J Yes – 10 J	40,0 42,0	III
	Tynk silikonowo-silikatowy ATLAS	No – 3 J Yes – 10 J	- 40,0	II
ETICS after ageing on the small samples				
ETICS with TR 100 EPS panels according to Annex B and standard mesh (single layer)		**Cracks**	**Max. crack diameter (mm)**	**Impact resistance category**
Rendering system: base coat **ATLAS GRAWIS U** + key-coat + finishing coats indicated hereafter:	ATLAS CERMIT SN mineral ATLAS CERMIT DR mineral	Yes – 3 J Yes – 10 J	39,0 66,0	III
ETICS with TR 80 EPS panels according to Annex B and standard mesh (single layer)		**Cracks**	**Max. crack diameter (mm)**	**Impact resistance category**
Rendering system: base coat **ATLAS GRAWIS U** + key-coat + finishing coats indicated hereafter:	ATLAS CERMIT SN mineral ATLAS CERMIT DR mineral	Yes – 3 J Yes – 10 J	31,0 59,0	III
	Tynk akrylowy ATLAS	Yes – 3 J Yes – 10 J	30,0 50,0	III
	Tynk akrylowo-silikonowy ATLAS	Yes – 3 J Yes – 10 J	33,0 46,0	III
	Tynk silikonowy IN ATLAS	Yes – 3 J Yes – 10 J	33,0 46,0	III
	Tynk silikonowy ATLAS	Yes – 3 J Yes – 10 J	54,0 52,0	III
	Tynk silikonowo-silikatowy ATLAS	No – 3 J Yes – 10 J	- 30,0	II

Table A5.1

	Finishing coat	Equivalent air thickness s_d m
Rendering system: base coat **ATLAS GRAWIS U** (thickness 3 - 4 mm) + key-coat + finishing coats and decorative coat indicated hereafter:	ATLAS CERPLAST + ATLAS CERMIT SN / DR mineral *thickness 3,0 mm*	0,2
	ATLAS CERPLAST + ATLAS CERMIT SN / DR mineral + ATLAS ARKOL N *thickness 3,1 mm*	0,2
	ATLAS CERPLAST + ATLAS CERMIT SN / DR mineral + ATLAS FASTEL NOVA/SALTA *thickness 3,1 mm*	0,2
	ATLAS CERPLAST + ATLAS CERMIT SN / DR mineral + ATLAS ARKOL S/SALTA S *thickness 3,1 mm*	0,2
	ATLAS CERPLAST + ATLAS CERMIT SN / DR mineral + ATLAS SALTA N *thickness 3,1 mm*	0,2
	ATLAS CERPLAST + Tynk akrylowy ATLAS *thickness 2,0 mm*	0,2
	ATLAS CERPLAST + Tynk akrylowy ATLAS + ATLAS ARKOL N *thickness 2,1 mm*	0,4
	ATLAS CERPLAST + Tynk akrylowy ATLAS + ATLAS SALTA E *thickness 2,1 mm*	0,4
	ATLAS CERPLAST + Tynk akrylowy ATLAS + ATLAS ARKOL E *thickness 2,1 mm*	0,5
	ATLAS CERPLAST + Tynk akrylowy ATLAS + ATLAS SALTA N *thickness 2,1 mm*	0,4
	ATLAS CERPLAST + Tynk akrylowy ATLAS + ATLAS FASTEL NOVA/SALTA *thickness 2,1 mm*	0,4
	ATLAS SILKON ANX + Tynk akrylowo-silikonowy ATLAS *thickness 2,0 mm*	0,2
	ATLAS SILKON ANX + Tynk akrylowo-silikonowy ATLAS + BATLAS SALTA N *thickness 2,1 mm*	0,2
	ATLAS SILKON ANX + Tynk akrylowo-silikonowy ATLAS + ATLAS ARKOL N *thickness 2,1 mm*	0,2
	ATLAS SILKON ANX + Tynk akrylowo-silikonowy ATLAS + ATLAS FASTEL NOVA/SALTA *thickness 2,1 mm*	0,3
	ATLAS SILKON ANX + Tynk silikonowy IN ATLAS *thickness 2,0 mm*	0,2
	ATLAS SILKON ANX + Tynk silikonowy IN ATLAS + ATLAS SALTA N *thickness 2,1 mm*	0,2
	ATLAS SILKON ANX + Tynk silikonowy IN ATLAS + NATLAS ARKOL N *thickness 2,1 mm*	0,2
	ATLAS SILKON ANX + Tynk silikonowy IN ATLAS + ATLAS FASTEL NOVA/SALTA *thickness 2,1 mm*	0,3

ATLAS GRAWIS	**Annex A5.1** of European Technical Assessment ETA-16/0933
Water vapour permeability	

Table A5.2

	Finishing coat	Equivalent air thickness s_d m
Rendering system: base coat **ATLAS GRAWIS U** (thickness 3 - 4 mm) + key-coat + finishing coats and decorative coat indicated hereafter:	ATLAS SILKON ANX + Tynk silikonowy ATLAS *thickness 2,0 mm*	0,3
	ATLAS SILKON ANX + Tynk silikonowy ATLAS + ATLAS ARKOL N *thickness 2,1 mm*	0,4
	ATLAS SILKON ANX + Tynk silikonowy ATLAS + ATLAS SALTA N *thickness 2,1 mm*	0,5
	ATLAS SILKON ANX + Tynk silikonowy ATLAS + ATLAS ARKOL S/SALTA S *thickness 2,1 mm*	0,3
	ATLAS SILKON ANX + Tynk silikonowy ATLAS + ATLAS FASTEL NOVA/SALTA *thickness 2,1 mm*	0,4
	ATLAS SILKON ANX + Tynk silikonowo-silikatowy ATLAS *thickness 2,0 mm*	0,2
	ATLAS SILKON ANX + Tynk silikonowo-silikatowy ATLAS + ATLAS ARKOL S/SALTA S *thickness 2,1 mm*	0,4
	ATLAS SILKON ANX + Tynk silikonowo-silikatowy ATLAS + ATLAS FASTEL NOVA/SALTA *thickness 2,1 mm*	0,4
	ATLAS SILKON ANX + Tynk silikonowo-silikatowy ATLAS + ATLAS SALTA N *thickness 2,1 mm*	0,5
	ATLAS SILKON ANX + Tynk silikonowo-silikatowy ATLAS + ATLAS ARKOL N *thickness 2,1 mm*	0,4

Table A6.1

Bond strength between the base coat and the insulation product					
Insulation product	Base coat	Conditioning before the test	Rupture type	Bond strength (kPa)	
				Min.	Mean
EPS panels	ATLAS GRAWIS U (approx. 3 mm)	Initial state (dry conditions)	failure in the insulation product	80	80
		After hygrothermal cycles (on the rig)		80	80

Table A6.2

Bond strength between the adhesive and the substrate					
Substrate	Adhesive (and tested thickness)	Conditioning before the test	Rupture type	Bond strength (kPa)	
				Min.	Mean
Concrete	ATLAS GRAWIS U (approx. 3 mm)	Initial state (dry conditions)	failure in the adhesive	870	910
		2 days immersion and 2 hours drying	failure in the adhesive	730	810
		2 days immersion and min. 7 days drying	failure in the adhesive	980	1000
	ATLAS GRAWIS S (approx. 3 mm)	Initial state (dry conditions)	failure in the adhesive	790	830
		2 days immersion and 2 hours drying	failure in the adhesive	620	690
		2 days immersion and min. 7 days drying	failure in the adhesive	920	960

Table A6.3

Bond strength between the adhesive and the insulation product					
Insulation product	Adhesive (and tested thickness)	Conditioning before the test	Rupture type	Bond strength (kPa)	
				Min.	Mean
EPS panels	ATLAS GRAWIS U (approx. 3 mm)	Initial state (dry conditions)	failure in the insulation product	100	110
		2 days immersion and 2 hours drying		90	90
		2 days immersion and min. 7 days drying		110	110
	ATLAS GRAWIS S (approx. 3 mm)	Initial state (dry conditions)	failure in the insulation product	100	110
		2 days immersion and 2 hours drying		100	100
		2 days immersion and min. 7 days drying		110	120

Table A7.1

Bond strength after ageing of finishing coat tested on the rig					
Insulation product	**ETICS configuration**		**Rupture type**	**Bond strength (kPa)**	
				Individual	**Mean**
EPS panels	**Rendering system:** base coat **ATLAS GRAWIS U** + key-coat + finishing coats indicated hereafter:	Tynk akrylowy ATLAS	failure in the insulation product	80	**80**
				80	
				80	
				90	
				80	
		Tynk akrylowo-silikonowy ATLAS	failure in the insulation product	110	**90**
				100	
				80	
				80	
				90	
		Tynk silikonowy IN ATLAS	failure in the insulation product	110	**90**
				100	
				80	
				80	
				90	
		Tynk silikonowy ATLAS	failure in the insulation product	110	**100**
				90	
				100	
				100	
				100	
		Tynk silikonowo-silikatowy ATLAS	failure in the insulation product	110	**100**
				90	
				110	
				100	
				80	

ATLAS GRAWIS	**Annex A7.1** of European Technical Assessment ETA-16/0933
Bond strength after ageing	

Table A7.2

Bond strength after ageing of finishing coat not tested on the rig					
Insulation product	**ETICS configuration**		**Rupture type**	**Bond strength (kPa)**	
				Individual	**Mean**
EPS panels	**Rendering system:** base coat **ATLAS GRAWIS U** + key-coat + finishing coats indicated hereafter:	ATLAS CERMIT SN mineral ATLAS CERMIT DR mineral	failure in the insulation product	100 90 90 90 90	**90**

ATLAS GRAWIS	**Annex A7.2** of European Technical Assessment ETA-16/0933
Bond strength after ageing	

Table A8

Thermal resistance	[(m²·K)/W]
R_{render}	0,02
R_{ETICS}	≥ 1,00

Information on calculation of thermal resistance and thermal transmittance of ETICS:

The additional thermal resistance provided by the ETICS (R_{ETICS}) to the substrate wall is calculated from the thermal resistance of the thermal insulation product ($R_{insulation}$), determined in accordance with 2.2.23.1, and from either the tabulated R render value of the render system (R_{render} is about 0.02 m²K/W) or R_{render} determined by test according to EN 12667 or EN 12664 (depending on expected thermal resistance).

$$R_{ETICS} = R_{insulation} + R_{render}\ [(m^2 \cdot K)/W]$$

as described in EN ISO 10456.

The thermal bridges caused by mechanical fixing devices influence the thermal transmittance of the entire wall and shall be taken into account using the following calculation:

$$U_c = U + \Delta U\ [W/(m^2 \cdot K)]$$

with: U_c corrected thermal transmittance of the entire wall, including thermal bridges

U thermal transmittance of the entire wall, including ETICS, without thermal bridges

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

$R_{substrate}$ thermal resistance of the substrate wall [(m²·K)/W]

R_{se} external surface thermal resistance [(m²·K)/W]

R_{si} internal surface thermal resistance [(m²·K)/W]

ΔU correction term of the thermal transmittance for mechanical fixing devices

$= \chi_p \cdot n$ (for anchors) (formula for U_c)

χ_p point thermal transmittance value of the anchor [W/K]. If not specified in ETA for anchors, the following values apply:

= 0.002 W/K for anchors with a plastic screw/nail, stainless steel screw/nail with the head covered by at least 15 mm plastic material, or with a minimum 15 mm air gap at the head of the screw/nail

= 0.004 W/K for anchors with a galvanized carbon steel screw/nail with the head covered by at least 15 mm plastic material or a minimum 15 mm air gap at the head of the screw/nail

= 0.008 W/K for all other anchors (worst case)

n number of anchors per m². In case n is more than 16, the formula for U_c is not applied

The influence of thermal bridges can also be calculated as described in EN ISO 10211.

It shall be calculated according to this standard if there are more than 16 anchors per m² foreseen. The declared χ_p values do not apply in this case.

Table B1

Factory-prefabricated expanded polystyrene (EPS) panels according to EN 13163		
Description and characteristics		**EPS panels**
Reaction to fire EN 13501-1		Class E
Thermal resistance ($m^2 \cdot K$)/W		Defined in the CE marking in reference to EN 13163
Thickness tolerance EN 823		EPS-EN 13163 – T1
Length tolerance EN 822		EPS-EN 13163 – L2
Width tolerance EN 822		EPS-EN 13163 – W2
Squarness tolerance EN 824		EPS-EN 13163 – S5
Flatness tolerance EN 825		EPS-EN 13163 – P5
Dimensional stability	**laboratory conditions** EN 1603	EPS-EN 13163 – DS(N)2
	under specified temperature and humidity EN 1604	EPS-EN 13163 – DS(70,-)1 or EPS-EN 13163 – DS(70,-)2
Short-term water absorption (partial immersion) (kg/m^2) EN 1609		≤ 1,0
Water vapour diffusion resistance factor (μ) EN 12086		20 to 60
Tensile strength perpendicular to the faces in dry conditions EN 1607		EPS-EN 13163 – TR80 or EPS-EN 13163 – TR100
Bending strength (kPa) EN 12090		≥ 75
Shear strength (kPa) EN 12090		≥ 20
Shear modulus (kPa) EN 12090		≥ 1000

Table C1

Glass fibre mesh trade name	Description	Direction	Tensile strength N/mm (average value)		Elongation ε % (average value)	
			In the as-delivered state	After alkalis conditioning	In the as-delivered state	After alkalis conditioning
R 117 A 101 / AKE 145 / VERTEX 145	see ETA-13/0392	warp	23	23	2,1	2,1
		weft	28	28	2,4	2,4
SSA 1363-145	see ETA-16/0526	warp	49	25	3,8	2,1
		weft	50	29	3,7	2,3
ATLAS 150	see ETA-16/0526	warp	46	24	3,7	1,9
		weft	44	24	3,5	1,9
ATLAS 165	see ETA-16/0526	warp	43	26	3,6	2,3
		weft	45	29	3,9	2,3

ATLAS GRAWIS	**Annex C** of European Technical Assessment ETA-16/0933
Glass fibre mesh characteristics	