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European Technical Assessment

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General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) Nº305/2011:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Trade name of the construction product	**ACE PU-100**
Product family to which the construction product belongs	Liquid Applied Roof Waterproofing Kit, based on 100% pure Polyurea
Manufacturer	ARTLUX EUROPA, S.L. C/ del Campo Sagrado, 11, 33205 Gijón, Asturias (Spain)
Manufacturing plant(s)	C/ del Campo Sagrado, 11, 33205 Gijón, Asturias (Spain)
This European Technical Assessment contains	7 pages including 1 Annexes which form an integral part of this assessment. Annex 2. Contain confidential information and is not included in the ETA when that assessment is publicly available
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	Guideline for European Technical Approval (ETAG) nº 005, part 1-6 ed. 2004, used as European Assessment Document (EAD)
This version replaces	ETA 14/0143 issued on 02/ 06/ 2014

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SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

The Liquid Applied Roof Waterproofing Kit (LARWK) **"ACE PU-100"** is designed and installed in accordance with the manufacturer design and installation instructions, deposited at the IETcc. This LARWK comprises the following components, which are factory produced by the manufacturer or a supplier.

Componentes	Trade name	Consume
Primer	PRIMERFLEX PLUS	≥ 0.2 kg/m^2
Waterproofing membrane	ACE PU-100	≥1.6 kg/m^2.
Finish layer: Protection UV	AR-373	≥ 250 g/m^2
Film Slipperiness	AR-373 + Micronized ARTLUX (size < 2mm)	≥ 1 kg/m²

ACE PU-100 is a liquid applied roof waterproofing system based on 100% pure aromatic polyurea manufactured by the company ARTLUX EUROPA, S.L.

It consists of a two component liquid cured waterproofing membrane based on the reaction of isocyanate and amines, with or without pigment, a two- component polyurethane primer (Primerflex Plus) when needed for specific substrates, and a two-component aliphatic polyurethane top-coat for the UV protection if it has no other protection.

As assembled system these components form a homogeneous and continuous elastomeric roof waterproofing membrane, without internal protection layer, which once polymerized conforms an elastic lining, in form of a layer completely bonded to the support (concrete, mortar, ceramic, EPS, PUR FOAM and metal). The minimum layer thickness of the assembled membrane has to be 1.6 mm.

2 Specification of the intended use in accordance with the applicable EAD

The intended use of this System is the waterproofing of roof against the water, as in liquid as vapour form. This LARWK fulfills the Essential Requirements nº 2 (Safety in case of fire), nº 3 (Hygiene, health and the environment) and nº 4 (Safety in use) of the European Regulation 305/11.

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

This LARWK can be used on new or existing (retrofit) roofs. It can also be used on horizontal surfaces (singular details).

The performance levels of this System according to the Guide ETAG 005[1] Part. 1 and 6 are included in the annex 1. The provisions made in this European Technical Approval (ETA) are based on an assumed intended working life of the system of 25 years (W3). The indication given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are only to be regarded as a means for choosing the right products in relation to the expected economically reasonable working life of the works. "Assumed intended working life" means that, when an assessment following the ETAG provisions is made, and when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the Essential Requirements.

Installation. The Kit is installed on site. It is the responsibility of the manufacturer to guarantee that the information about design and installation of this LARWK is effectively communicated to the concerned people. This information can be given using reproductions of the respective parts of this European Technical Assessment. Besides, all the data concerning the execution shall be clearly indicated on the packaging and/or the enclosed instruction sheets using one or several illustrations.

Design. The fitness of the respective use for the levels of performance of this System stated in Annex 1 complies with the Spanish national requirements. In the Manufacture Technical Dossier MTD) the manufacture gives information on the quantities consumed and the processing, which shall lead to a thickness of the roof waterproofing ≥1.6 mm.

Execution. Particularly, it is recommended to consider:

- The kit installation has to carried out by qualified installers and it can only be used the components of the kit indicated in this ETA,
- the supervision of the amount of material used (kg/m^2) and the visual control to check that each coat cover totally the one below, can ensure the minimum thickness of the kits,
- inspection of the roof surface (cleanliness and correct preparation) before applying the roof waterproofing,

[1] ETAG N° 5, "Liquid applied roof waterproofing kits", Official Journal of the European Communities N° C 212/02, 06.09.2002.

- Precautions during installation.
- Compliance with suitable weather conditions for applying and curing.
- It is applied by projection device in heat, with the following characteristics: Pressure 170-200 bar, Deposit temperature product 77ºC, temperature product conduct 75ºC.

Before, the installation of ACE PU-100, it is recommended to read its security card.

Use, maintenance and repair of the works. In those roofs with deteriorated areas of the waterproof layers, they will be repaired removing all the deteriorated layers. Afterwards, the new product will be assembled following the installation instruction and the new coats must overlap, at least 3 cm, to the coat no deteriorated. Further installation details are laid down in the MTD place at IETcc.

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

The identification tests and the assessment for the intended use of this LARWK according to the Essential Requirements were carried out in compliance with the ETA Guidance nº 005: Guideline for European Technical Approval of Liquid applied roof waterproofing kits, ETAG 005, edition 2004, Part 1 "General" and Part 6 "Specific stipulations for kits based on polyurethane" (called ETAG 005, in this ETA).

3.1 LARWK Characteristics

Safety in case of fire ((BWR 2)

External fire performance. Classification: $B_{roof}(t1)$ according EN 13501-5 for supports included in point 1for roof slope < 20°, except for the EPS, PUR FOAM support that the classification is NPA.

Reaction to fire. Euroclass F

Hygiene, health and environment (BWR 3)

Resistance to water vapour (EN 1931). μ = 2.200 (thickness 2 mm)

Watertightness (EOTA TR-003). Watertight

Statement of dangerous substances. According to the manufacturer's declaration taking account of EOTA TR 034, the product installed does not contain and release any dangerous substance.

Resistance to wind loads (EOTA TR-4). Pass (>50 kPa)

Resistance to dynamic indentation (EOTA TR- 6). Resistance Level: I_4

Resistance to static indentation (EOTA TR-7).

Support	Load (N)	Resistance level
Steel	250	L4
EPS	250	L4

Resistance to fatigue movement (1.000 cycles) (EOTA TR-8). Pass

Resistance to low temperatures effects (-20ºC). Dynamic indentation, Resistance Level: I_4

Resistance to high temperatures effects. Static indentation.

Temperature ºC	Support	Load (N)	Resistance level
60º	Steel	250	L4
	EPS	250	L4
90º	Steel	250	L4
	EPS	250	L4

Resistance to heat ageing (EOTA TR-11). The samples are exposed to 80ºC during 200 days.

Fatigue movement	pass
Dynamic indentation (-20ºC)	I4
Tensile strength (MPa) (EN ISO 527-3) (initial / ageing)	22 / 36
Tensile elongation (%) (EN ISO 527-3) (initial / ageing)	342 / 649

Resistance to UV-radiation in the presence of moisture (EOTA TR- 10). The samples are exposed 5.000 hours to UV-radiation.

Dynamic indentation (-10ºC)	I_4
Tensile strength (MPa) (Type 2) (EN ISO 527-3) (initial / ageing)	21 / 16
Tensile elongation (%) (EN ISO 527-3) (initial / ageing)	363 / 270

Resistance to hot water ageing (EOTA TR-12).The samples are kept in touch with water at 60ºC for 60d for load user of P3 and 180 days for P4.

Temperature ºC	Support	60 d		180 d	
		Load (N)	Resistance Level	Load (N)	Resistance Level
90º	Steel	250	L4	250	L4
	EPS	250	L4	250	L4

Resistance to wind loads Pass (>50 kPa)

Resistance to plant roots (EN 13948). NPA.

Safety in use (BWR 4)

Slipperiness (ENV 12633:2003 Annex A). The kit with **PRIMERFLEX PLUS** + **ACE PU-100**+ **AR-373**+ extra AR-373 with micronized ARTLUX, show a Rd= 50. According to EN 13893: NPA.

Related aspects of serviceability

Effect of weather conditions. The system does show changes in its tensile properties, when the system is assembled and cured under two temperature conditions of 5ºC and 40ºC, but these values obtained complied with the manufacturer's specifications (pass).

Effect of day joints. The delamination strength test performed on a layer assembled over other one, it shows a good delamination strength, being upper to required value of 50 kPa. (pass).

3.2 Characteristics of the components

The characteristics of the components of this System show the following values, which compliance with their respective tolerances stated in the Manufacture Technical Dossier (MTD).

ACE PU-100. Waterproofing liquid constituted by polieter-amines and pre-polymer of isocianate, with loads, and with or without mineral pigments, and additives (anti-air entering, biocides, etc.). The main characteristics of this waterproof liquid are:

Properties	Component A	Component B
Density (g/cm³) (ISO 1675)	1,11 g/ml ± 5%	1,02 – 1, 05
Dry extract (105ºC) (% weight) (EN 1768)	≤ 100	≤ 100
Ash content (450°C) (% weight) (EN 1879)	≤ 0	1,98 - 2,5 %
Viscosity (cps), (S63, 30 rpm, 25ºC) (EN ISO 2555)	800 ± 50	350 - 500

PRIMERFLEX PLUS

Properties	Component A	Component B
Density (g/cm³) (ISO 1675)	1,00 ± 5%	0,9773 ± 5%
Dry extract (105ºC) (% weight) (EN 1768)	≤ 100	~ 99,8
Ash content (450°C) (% weight) (EN 1879)	≤ 0	~ 0,051
Viscosity (cps), (S63, 30 rpm, 25ºC) (EN ISO 2555)	900± 50	600 mPas DIN 53015

AR-373. UV External protection. Aliphatic Polyurethane resins.

Properties	Component A	Component B
Density (g/cm³) (ISO 1675)	1,280 ± 5%	1,070 ± 5%
Dry extract (105ºC) (% weight) (EN 1768)	60 ± 2	75 ± 2
Ash content (450°C) (% weight) (EN 1879)	-----	-----
Viscosity 20ºC: Comp A (s), (Ford Cup nº 4) / Comp B (ps), (RV3, 10 rpm)	150" –170"	17

Micronized ARTLUX

Properties	Values
Nature	Quartzite (SiO_2)
Form	Irregular
Particle size	0.1-2 mm

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

System of Attestation of Conformity. The European Commission according to the decision (98/599/EC of October 1998, Official Journal of the European Communities N° L 287, 24.10.1998) on the procedure of attestation of conformity for the procedure of attestation of conformity (Annex III, clause 2(ii) second possibility of EU Regulation 305/2011) for liquid applied roof waterproofing kits has laid down for this type of material

Product	Intended uses	Level or Classes	System
ACE PU-100	Liquid Applied Roof Waterproofing Kit	Any	3

According to this decision, system 3 of Attestation of Conformity also applies with regard to external fire performance. The system 3 provides: Tasks for the manufacturer: Factory production control and Tasks for the approved body: Initial type-testing of the product.

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

The ETA is issued for this kit on the basis of agreed data/information, deposited at IETcc, which identifies the product that has been assessed and judged. It is the manufacturer's responsibility to make sure that all those who use the kit are appropriately informed of specific conditions according to sections 1, 2, 4 and 5 including the annexes of this ETA. Changes to the LARWK or the components or their production process, which could result in this deposited data/information being incorrect should be notified to the IETcc before the changes are introduced. IETcc will decide whether or not such changes affect the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

5.1 Tasks of the manufacturer

Factory production control. The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this ETA.

The manufacturer may only use components stated in the technical documentation of this ETA including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the Control Plan[2] which is part of the Technical Documentation of this ETA. The Control Plan has been agreed between the manufacturer and the IETcc and is laid down in the context of the factory production control system operated by the manufacturer and deposited at the IETcc. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer. The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 in the field of LARWK in order to undertake the actions laid down in this clause. For this purpose, the control plan shall be handed over by the manufacturer to the notified bodies involved.

For initial type – testing, the results of the tests performed as part of the assessment for the ETA shall be used unless there are changes in the production line or plant. In such cases the necessary initial type- testing has to be agreed with the IETcc.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this ETA.

5.2 Tasks of notified bodies. The notified body shall perform

Initial type-testing of the product. The initial type-testing have been conducted by the IETcc to issue this ETA in accordance with chapter 5 of the guideline "Liquid applied roof waterproofing kits" (ETAG 005) part 1and 6. The verifications underlying this ETA have been furnished on samples from the current production; these will replace the initial type-testing carried out by the manufacturer. The IETcc has assessed the results of these tests in accordance with chapter 6 of this ETA –Guideline, as part of the ETA issuing procedure.

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[2] The control plan is a confidential part of this European Technical Assessment and only handed over to the notified body involved in the procedure of attestation of conformity. See section 3.2.2.

Issued in Madrid on 7 November 2016.
by

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On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja

Marta Castellote
Director

Annex 1.

Characteristics of the System "ACE PU-100"

Minimum thickness	1,6 mm
Water vapour diffusion resistant factor	μ ≈2.200
Resistance to wind loads	> 50 kPa
Resistance to plant roots	NPA
Statement on dangerous substances	Does not contain any
Resistance to slipperiness	Rd= 50 with Micronized ARTLUX

Performance levels according to the intended use

External fire performance	Broof (t1) roof slope < 20°// NPA: EPS support
Fire reaction	F
Expected working life	W3
Climatic zone of use	S (Severe)
User loads	P4: TH4
Roofs slopes	S1 – S4
Minimum surface temperatures	TL3 (- 20 ^{0}C)
Maximum surface temperatures	TH4