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European Technical Assessment

**ETA 16/0582
of 07/07/2016**

I General Part

**Technical Assessment Body issuing the
ETA and designated according to Article
29 of the Regulation (EU) No 305/2011:
Trade name of the construction product**

Technical and Test Institute for Construction
Prague

**Product family to which the construction
product belongs**

**LIQUID APPLIED POLYSILOXANE ROOF
WATERPROOFING KITS
LIQUID APPLIED ROOF
WATERPROOFING ON THE BASIS OF
POLYSILOXANE**

Manufacturer

**Gaco Western
1245 Chapman Drive,
Waukesha WI USA 53186**

Manufacturing plant

**Gaco Western
1245 Chapman Drive,
Waukesha WI USA 53186**

**This European Technical Assessment
contains**

13 pages including 1 annex which forms an
integral part of this assessment.

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

EAD No. 030019-00-0402 for Liquid applied
roof waterproofing on the basis of
polysiloxane, edition September 2014

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II Specific part

1 Technical description of the product (definition of the product)

This European Technical Assessment applies to the Liquid applied roof waterproofing kits(LARWK) "Liquid applied polysiloxane roof waterproofing kits".

The kits are composed of the following components, which are factory produced by the manufacturer or a supplier:

Coatings:

GacoFlex E5320 is a two-component water based epoxy primer used to promote adhesions to substrates.

minimum quantity consumed on:

a) smooth surfaces, apply one coat at the rate of 1 l/ 1.64 m²

b) granulated and other rough surfaces, apply two separate coats at the rate of 1 l/ 2.45 m² per coat (1 gallon per 100 square feet)

GacoProEco is a single-component(solvent-free) moisture curing, elastomeric silicone coating and forms a continuous waterproofing membrane. It is available in two colours - GPE00 is white and GPE22 is gray. The coating extends the life of existing roofs.

The minimal thickness of wet layer shall be 0.61 mm.

minimum quantity consumed on:

a)single ply membrane roofs, apply one coat at the rate of 1 l/ 12.3 m² (1 gallon per 500 sq. ft.)

b) metal - 1 l/ 7.4 m² (1 gallon per 300 sq. ft.)

c) asphalt-based surfaces:

-smooth cap sheet, apply one separate coat of 2 l/ 6.1 m² (2 gallons per 250 sq. ft.).

Allow to dry 2 hours between coats.

-granulated surfaces, apply 2 separate coats of 1 l/ 4.9 m² (1 gallon per 200 sq. ft.).

Allow to dry 2 hours between coats.

Ancillary products:

GacoWash – concentrated cleaner used to clean substrates before application of the coatings

GacoSeamSeal (SF2000) – fiber reinforced material used for patching areas and treatment of joints.

Suitable substrates:

EPDM* , TPO* and PVC* waterproofing membranes, modified bitumen sheets*, steel, concrete, etc.

*Note: * Regarding the declaration of intended use for existing roofs the substrate shall be aged.*

Reinforcement:

If the used bottom support(the top layer forms waterproofing membrane) is concrete, it is necessary to reinforce the coating with the polyester fiber mesh **GACOFLEX® 66S** (minimal weight per unit area: 50.0 g/m²) and apply the coatings in accordance with the manufacturer's instructions.

If the manufacturer decides to use another type of polyester fiber mesh, the reinforcement shall fulfill the minimal requirements mentioned in Annex No. 1 to this ETA.

The LARWK is designed, applied and installed in accordance with the ETA holder's instructions.

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

2.1 Intended use

The "Liquid applied polysiloxane roof waterproofing kits" are intended to be used as the waterproofing of roof surfaces against penetration of atmospheric water.

The LARWK can be used only for existing roofs.

This LARWK is made of no 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 effects of weathering.

The performance levels of the kits according to the EAD are stated in the Table No. 1.

The provisions made in this ETA are based on an assumed working life of the kit of 10 years (W2), provided that the conditions laid down in sections for the packaging, transport, storage, installation, use, maintenance and repair of this ETA are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as means for choosing the right products in relation to the expected economically reasonable working life of the works.

Assumed intended working life means the , when an assessment following the EAD 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.

Table No. 1 : Performance levels of the kits according to their intended use

| Performance | Classification/Categorization level | |
|-----------------------------|-------------------------------------|----|
| External fire performance | B _{roof} (t3) | |
| Reaction to fire | E | |
| Expected working life | W2(10 years) | |
| Climatic zone of use | M(moderate) and S(severe) | |
| User loads | less compressible substrate | P2 |
| | most compressible substrate | P1 |
| Roof slopes | S1-S2 | |
| Minimum surface temperature | TL3(TL4) -20°C (-30°C) | |
| Maximum surface temperature | TH4(90°C) | |

2.2 Manufacturing

The European Technical Assessment is issued for the kits on the basis of agreed data/information, deposited with the Technical and Test Institute for Construction Prague, which identifies the kits that have been assessed and judged. Changes to the kits or production process, which could result in this deposited data/information being incorrect, shall be notified to the Technical and Test Institute for Construction Prague before the changes are introduced. The Technical and Test Institute for Construction Prague will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

2.3 Design and installation

The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

Application of the components

The manufacturer's installation instructions contain information on the:

- list of suitable substrates;
- definition of an acceptable surface;
- preparation of the substrate (cleanness, moisture content, flatness, texture, maximum allowed cracks etc.);
- definition and application rate of suitable primer for each substrate;
- method of application, overlaps (if any), order of application and finish layers;
- field of use of internal layer (on the whole surface, or joints,) and its incorporation in the assembled system;
- required minimum thickness of the various layers;
- period of time between the application of each components, taking account of weather conditions;
- total drying time of the whole assembled system.

Where kits are applied by mixing components while spraying, the installation instructions contain specific guidance on process control on site (during applications):

- adjustment of machinery and devices used for mixing of components;
- adjustment of mixing ratio related to temperature, moisture, absorption capacity of the substrate;
- adjustment of pressure related to height of the works, viscosity of components etc.

2.4 Packaging, transport and storage

The information on packaging, transport (minimum and maximum temperature for transport) and storage (storage temperature and way of storage) is given in the manufacturer's technical documentation. Where kits incorporate chemicals, flammable components or other potentially hazardous materials the instructions shall contain specific guidance on restrictions and/or conditions for handling, transport and storage of these components. It is the responsibility of the manufacturer(s) to ensure that this information is made know to the concerned people.

2.5 Use, maintenance and repair

The finishing coat shall normally be maintained in order to fully preserve the kit performance. Maintenance includes at least:

- visual inspection of the kit
- the repairing of damaged areas due to accidents,
- the aspect maintenance with products adapted and compatible with the kit(s).

Necessary repairs should be performed as soon as the need has been identified.

It is important to be able to carry out maintenance as far as possible using readily available products and equipment, without spoiling appearance. Only products which are compatible with the kit(s) shall be used.

The information on use, maintenance and repair including inspection sequences and specific measures related to maintenance of protective finish layers are given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) to ensure that this information is made know to the concerned people.

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

The assessment of the intended use of the LARWK and identification tests of the LARWK's components were carried out in compliance with the EAD.

3.1 The characteristics of the LARWK

Table No. 2: Characteristic of the LARWK

| No | Essential characteristic and method of verification/assessment | Expression of product performance |
|--|--|-----------------------------------|
| Essential Requirement 1: Mechanical resistance and stability* | | |
| No specific requirements | | |
| Essential Requirement 2: Safety in case of fire | | |
| 1 | External fire performance (EN 13501-5 + A1) | B _{roof} (I3) |
| 2 | Reaction to fire (EN 13501-1 + A1) | Class E |

| No | Essential characteristic and method of verification/assessment | Expression of product performance | |
|---|---|-----------------------------------|----------------|
| Essential Requirement 3: Hygiene, health and environment | | | |
| 3 | Content and/or release of dangerous substances | *) | |
| 4 | Water vapour permeability (EN 1931) | μ | < 2000 |
| | | S_d | < 1 m |
| 5 | Watertightness (EOTA TR-003) | Pass | |
| 6 | Resistance to mechanical damage | | |
| 6a | Resistance to dynamic indentation at 23°C (EOTA TR-006) | most compressible substrate | I ₃ |
| | | less compressible substrate | I ₃ |
| 6b | Resistance to static indentation at 23°C (EOTA TR-007) | most compressible substrate | L ₃ |
| | | less compressible substrate | L ₁ |
| 7 | Resistance to fatigue movement -10°C, 500 cycles (EOTA TR-008) | Pass | |
| 8 | Resistance to the effects of low and high surface temperatures | | |
| 8a | Resistance to low temperatures | | |
| 8a-1 | Severe low temperature -20°C <i>Resistance to dynamic indentation at -20°C</i> (EOTA TR-006) | most compressible substrate | I ₃ |
| | | less compressible substrate | I ₃ |
| 8a-2 | Extreme low temperature -30°C <i>Crack bridging ability at -30°C</i> (EOTA TR-013) | Pass | |
| 8b | Resistance to high temperature: | | |
| 8b-1 | Resistance to static indentation at 90° (EOTA TR-007) | most compressible substrate | L ₂ |
| | | less compressible substrate | L ₂ |
| Essential Requirement 4: Safety and accessibility in use | | | |
| 9 | Resistance to wind load | | |
| 9a | Resistance to delamination at 23°C (EOTA TR-004) | Pass (> 50kPa) | |
| 9b | Resistance to delamination at 40°C (EOTA TR-004) | Pass (> 50kPa) | |
| 10 | Slipperiness (EN 13893) Dynamic coefficient of friction | ≥ 0.50 | |

| No | Essential characteristic and method of verification/assessment | Expression of product performance | |
|---|---|-----------------------------------|----------------|
| General aspects relating to the performances of the construction product | | | |
| 11 | Working life (art. 2.2.11 of EAD 030019-00-0402) | W2(10 years) | |
| 12 | Resistance to heat ageing (EOTA TR-011) | | |
| 12a | a) Climate M, 50 days at 80°C after exposure: | | |
| 12a-1 | Resistance to dynamic indentation at -20°C (EOTA TR-006) | most compressible substrate | I ₃ |
| | | less compressible substrate | I ₃ |
| 12a-2 | Resistance to fatigue movement at -10°C, 50 cycles (EOTA TR-008) | Pass | |
| 12a-3 | Tensile test (EN ISO 527-3): Tensile strength at F_{max} | ≥ 3 MPa | |
| | | ≥ 120 % | |
| 12b | b) Climate S, 100 days at 80°C after exposure: | | |
| 12b-1 | Resistance to dynamic indentation at -20°C (EOTA TR-006) | most compressible substrate | I ₂ |
| | | less compressible substrate | I ₂ |
| 12b-2 | Resistance to fatigue movement at -10°C, 50 cycles (EOTA TR-008) | Pass | |
| 12b-3 | Tensile test (EN ISO 527-3): Tensile strength at F_{max} | ≥ 2.5 MPa | |
| | | ≥ 100 % | |
| 13 | Resistance to UV radiation in the presence of moisture W2 - radiant exposure 400 MJ/m² (EOTA TR-010) | | |
| 13a | a) Climate M after exposure: | | |
| 13a-1 | Resistance to dynamic indentation at -10°C (EOTA TR-006) | most compressible substrate | I ₂ |
| | | less compressible substrate | I ₃ |
| 13a-2 | Tensile test (EN ISO 527-3): Tensile strength at F_{ma} Elongation | ≥ 2 MPa | |
| | | ≥ 80 % | |

| No | Essential characteristic and method of verification/assessment | Expression of product performance | |
|--|--|-----------------------------------|----------------|
| 13b | b) Climate S after exposure: | | |
| 13b-1 | Resistance to dynamic indentation at -10°C (EOTA TR-006) | most compressible substrate | L ₂ |
| | | less compressible substrate | L ₂ |
| 13b-2 | Tensile test (EN ISO 527-3): Tensile strength at F_{max} Elongation | ≥ 2 MPa | |
| | | ≥ 80 % | |
| 14 | Resistance to water ageing(30 days, 60°C) (EOTA TR-012) | | |
| 14a | Resistance to static indentation at 90°C (EOTA TR-007) | most compressible substrate | L ₂ |
| | | less compressible substrate | L ₁ |
| 14b | Resistance to delamination at 23°C (EOTA TR-004) | Pass (>50 kPa) | |
| 14c | Tensile test (EN ISO 527-3): Tensile strength at F_{max} Elongation | ≥ 2.5 MPa | |
| | | ≥ 120 % | |
| 15 | Resistance to plant roots (EN 13948) | No performance assessed | |
| Related aspects of serviceability | | | |
| 16 | Effects of application conditions: Tensile test (EN ISO 527-3) at 23°C: Tensile strength at F_{max} Elongation | ≥ 3 MPa | |
| | | ≥ 120 % | |
| 17 | Effects of day joints Resistance to delamination at 23°C (EOTA TR-004) | Pass (> 50 kPa) | |

Notes: *)

10-30% of Bisphenol A diglycidyl ether – bisphenol A copolymer in part A of the product GacoFlex E5320

0.5-1.5 % of Bisphenol A-epichlorohydrin polymer in part B of the product GacoFlex E5320

Indication of no dangerous substances in other components.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products directive, these requirements need also to be complied with, when and where they apply.

Category IA3: Product with no contact to and no impact on indoor air

Category S/W2: Product with no direct contact to but possible impact on soil-, ground- and surface water

**Aged EPDM membrane is considered as the most compressible substrate and steel (instead of concrete) as the less compressible substrate.

***Performance levels of the kits according to their intended use are stated in Table No.1.

3.2 Identification according to Annex A of EAD

3.2.1 Primer

Table No. 3: GacoFlex E5320

| No | Product characteristic | Verification method | Expression of performance |
|----|------------------------|----------------------------|--|
| 1 | Nature | Declaration | two-component water based epoxy primer |
| 2 | Density | EN ISO 1675 | 1.34 g/cm ³ |
| 3 | Viscoslty | EN ISO 3219 EN ISO 2555 | * |
| 4 | IR-spectrum | EN 1767 | * |
| 5 | Curing time | EN ISO 9117-3 | 20 min |

*Note: *Detailed data have been deposited at the the Technical and Testing Institute for Construction Prague.*

3.2.2 Liquid roof waterproofing

Table No. 4: GacoProEco

| No | Product characteristic | Verification method | Expression of performance |
|----|---|----------------------------|---|
| 1 | Nature | Declaration | single-component (solvent-free) moisture curing, elastomeric silicone coating |
| 2 | Viscoslty | EN ISO 2555 EN ISO 3219 | * |
| 3 | Density | EN ISO 1675 | min. 1.33 g/cm ³ |
| 4 | Gel time | EN ISO 2535 | * |
| 5 | Ash content at 600°C | EN ISO 3451-1 | 60.42 % |
| 6 | Shore A Hardness a) after 7 days b) after 14 days | EN ISO 868 | (50±0.95) (53±0.74) |
| 7 | TGA | EN ISO 11358 | * |
| 8 | IR-spectrum | EN 1767 | * |

*Note: * Detailed data have been deposited at the the Technical and Testing Institute for Construction Prague.*

3.2.3 Internal layer(reinforcement)

Table No. 5: Gacoflex 66S

| No | Product characteristic | Verification method | Expression of performance |
|----|------------------------|---------------------|----------------------------|
| 1 | Nature | Declaration | polyester mesh |
| 2 | Mass per unit area | EN 29073-1 | min. 50.0 g/m ² |
| 3 | Tensile strength | EN ISO 527-3 | min. 11 MPa |
| 4 | Tensile elongation | EN ISO 527-3 | min. 28 % |

3.2.4 Product

Table No. 6:

| No | Product characteristic | Verification method | Expression of performance |
|----|---|----------------------------|-----------------------------|
| 1 | Watertightness | EOTA TR 003 | Watertight |
| 2 | Resistance to mechanical damage Resistance do dynamic and static indentation at 23°C | EOTA TR 006 EOTA TR 007 | See Table No. 2 of this ETA |

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

4.1 AVCP System

According to the decision 98/599/EC of 25.01.1999 of the European Commission as amended by Commission Decision 2001/596/EC of 08.01.2001, the AVCP **system 3**

(regarding the external fire performance, reaction to fire and for all uses as roof waterproofing) applies.

(further described in clause 1.4 of Annex V, to Regulation (EU) No 305/2011)

This AVCP system is defined as follows:

System 3:

- a) Tasks for the manufacturer:
 - factory production control (FPC),
- b) Tasks for the Notified Body:
 - type testing of the product*.

*Note: *The type testing have been conducted by the Technical and Testing Institute for Construction Prague for issuing of this ETA. The results of the type testing performed as a part of the assessment for*

the ETA shall be used unless there are any changes in the production plant. In such cases the type testing shall be agreed with the Technical and Testing Institute for Construction Prague.

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

In order to help the Notified Body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

1) The ETA

Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.

2) Basic manufacturing process

The basic manufacturing process is described in sufficient detail to support the proposed FPC methods.

3) Product and materials specifications

The manufacturer's documentation includes:

- detailed drawings (possibly including manufacturing tolerances),
- incoming (raw) materials specifications and declarations,
- references to European and/or international standards,
- technical data sheets.

4) Control Plan (as a part of FPC)

The manufacturer and the Technical and Testing Institute for Construction Prague-branch Prague have agreed a control plan which is deposited with the Technical and Testing Institute for Construction Prague – branch Prague in documentation which accompanies the ETA. The control plan specifies the type and frequency of checks/tests conducted during production and on the final product. This includes the checks conducted during manufacture on properties that cannot be inspected at a later stage and for checks on the final product.

Products not manufactured by the manufacturer of the kit shall also be tested according to the control plan. It must be demonstrated to the Technical Assessment Body(TAB) that the FPC system contains elements securing that the manufacturer of the kit takes products conforming to the control plan from his supplier(s).

Issued in Prague on 07.07.2016



Head of the Technical Assessment Body

Annexes:

Annex No. 1: Minimal requirements for the internal layer (reinforcement)

Annex No. 1:

Table No. 1: Minimal requirements for the internal layer (reinforcement)

| No | Product characteristic | Verification method | Expression of performance |
|----|------------------------|---------------------|----------------------------|
| 1 | Nature | Declaration | polyester mesh |
| 2 | Mass per unit area | EN 29073-1 | min. 50.0 g/m ² |
| 3 | Tensile strength | EN ISO 527-3 | min. 11 MPa |
| 4 | Tensile elongation | EN ISO 527-3 | min. 28 % |