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# European Technical Assessment **ETA 21/ 0740** of 06/ 09/ 2021

English translation prepared by IETcc. Original version in Spanish language

## General Part

**Technical Assessment Body issuing the European Technical Assessment:**  
Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

**Trade name of the construction product**

**IMPERMAX POLYUREA H FLEX**

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

Liquid Applied Bridge deck Waterproofing

**Manufacturer**

**KRYPTON CHEMICAL, S.L.**

C/ Martí Franques nº 12. Pol. Ind. Les Tàpies  
43890 L'Hospitalet de l'infant. Tarragona, Spain  
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**Manufacturing plant(s)**

**This European Technical Assessment contains**

7 pages including 1 Annex, which 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 030675-00-0107  
Liquid applied Bridge Deck waterproofing Kits

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## Specific parts

### 1 Technical description of the product

IMPERMAX POLYUREA H FLEX is a liquid applied bridge deck waterproofing kit based on polyurea resin, manufactured by the company KRYPTON CHEMICAL, S.L. The waterproof membrane consists of a polyurea resins, bi-component, elastomeric; which once polymerised conforms a jointless elastic lining, in form of a layer completely bonded to the support (concrete).

This liquid applied bridge deck waterproofing kit is not intended to receive direct vehicular traffic in service and in this case will always be used beneath overlays of asphalt (mastic asphalt, asphalt concrete or concrete) which may have a protective character and/or additional waterproofing function. The kit "IMPERMAX POLYUREA H FLEX" is designed and installed in accordance with the manufacturer, design and installation instructions.

This kit comprises the following components, which are factory produced by the manufacturer.

Components	Trade name	Consumption	Thickness
Primer	RAYSTON EPOXY 100 (epoxy) + Broadcast of quartz sand (0,3- 0,8 mm. thick)	0,4- 0,5 kg/m <sup>2</sup> + 0,7 kg/m <sup>2</sup>	0,35 - 0,45 mm
Adhesion promoter for overlapping	Light abrasion of the surface + cleaning with RAYSTON SOLVENT + PU PRIMER	0,1 kg/m <sup>2</sup>	Non film-forming (0 mm)
Waterproofing membrane	IMPERMAX POLYUREA H FLEX	≥ 2 kg/m <sup>2</sup>	1,90 mm
Top coat	POROSITY SEALER FLEX + Broadcast of quartz sand (0,3--0,8 mm. thick) until saturation and removal of the excess of sand, when resin gets dry.	0,5 kg/m <sup>2</sup> + 2-3 kg/m <sup>2</sup>	0,90 mm

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

#### 2.1 Intended use(s)

The intended use of Liquid Applied Bridge Deck Waterproofing Kits is the waterproofing of the concrete deck of the bridge preventing or controlling the passage of water to the support.

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

This applied kit fulfils the Basic works requirements n° 1 (Mechanical resistance and stability), n° 3 (Hygiene, health and the environment) and n° 4 (Safety in use) of the European Regulation 305/11.

The kit is suitable for the following use categories according: (A) with overlay and intended to receive vehicular traffic:

- A.1 Overlay asphalt concrete applied at (160 ± 10) °C (CBM).
- A.2 Overlay of mastic asphalt applied at 220 °C to 250 °C (MA).
- A.3 Non-asphaltic overlays.

In the manufacturer's technical dossier (MTD) to this ETA the manufacturer gives specific information concerning the application of the product.

Kits used beneath ballast are not covered under the scope of this ETA.

#### 2.2 Relevant general conditions for the use of the kit

The provisions made in this European Technical Assessment are based on an assumed working life of 25 years from installation in the works, according to EAD 030675-00-0107, provided that the conditions lay

down for the installation, packaging, transport and storage as well as appropriate use, maintenance and repair are met. In this respect.

The indications given on the working life cannot be interpreted as a guarantee given neither by the product manufacturer nor by EOTA nor by the Technical Assessment Body issuing this ETA, but are regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

**Installation.** The kit is installed on site. It is the responsibility of the manufacturer to guarantee that the information about design and installation of these kits 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. In the MTD the manufacture gives information on the quantities consumed and the processing, which shall lead to a thickness of the deck waterproofing  $\geq 2,7$  mm.

Usage range of temperatures. The range of operational temperatures of the waterproofing layer is  $-40$  °C to  $+60$  °C. EN 1991-1-5 provides a correlation between the shade air temperature and bridge temperature component.

Condition of support. The support on which the waterproofing is applied shall have a surface texture of 0.3 mm to 1.5 mm. EN 1766: 2000, clause 7.2 or EN 13036-1: 2002 describe suitable methods for measuring surface texture.

The age of the concrete support is normally assumed to be in excess of three weeks and unless specific assessments have been made the cohesive strength of the concrete surface shall be greater than 1.5 MPa.

Weather conditions. The waterproofing system cannot be put in place during rain, hail or snow. The support temperature shall be greater than  $5$  °C and at least  $3$  °C above the dew point, unless specific assessments have been made.

Execution. Particularly, it is recommended to consider:

- The kit installation has to be carried out by qualified installers,
- it can only be used the components of the kit indicated in this ETA,
- the supervision of the amount of material used ( $\text{kg/m}^2$ ) and the control visual to check that each coat cover totally the one below, can ensure the minimum thickness of the kits,
- inspection of deck surface (cleanliness and correct preparation) before applying the deck waterproofing,
- It is applied by a hot spray applied machines. Temperatures, component A,  $70$  °C. Component B,  $65$  °C. Pressure about 170 bars.

Before, the installation of IMPERMAX POLYUREA H FLEX, it is recommended to read its security card.

**Use, maintenance and repair of the works.** In 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.

### **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 "IMPERMAX POLYUREA H FLEX" according to the Basic Work Requirements (BWR) were carried out in compliance with EAD 030675-00-0107. The characteristics of each system shall correspond to the respective values laid down in following tables of this ETA, checked by IETcc.

Methods of verification and of assessing and judging are listed afterwards.

### 3.1 Mechanical resistance and stability (BWR 1)

Basic requirement for construction works 1; Mechanical resistance and stability					
Essential characteristic		Relevant clause in EAD		Condition test	Values
Bond strength (kit to support)		2.2.1		P1, S0, T5	2.5 MPa A/B
Capacity to bridge cracks (-20 °C)		2.2.2		P1, S1+S2, T2	Watertight
Resistance to chloride ion penetration		2.2.3		P1, S0, T5	0.039 %
Resistance to dynamic actions	Resistance to perforation	2.2.4	2.2.4.1	P1, S0, T5	Pass (I4)
	Resistance to compaction of asphalt concrete		2.2.4.2	P1, S1.2, T5	Resistant and watertight
Resistance to heat impact (indirect method) (170 °C)	Bond strength (kit to support)	2.2.5		P1, S1, T5	2.2 MPa A/B
	Tensile stress (initial- ageing) 10 mm/min 23 °C / 1 mm/m -10 °C			P1, S0/S1, T5 / T3	19 / 24 MPa
	Elongation (initial- ageing) 10 mm/min 23 °C / 1 mm/m -10 °C				22 / 24 MPa
	Capacity to bridge cracks			2.2.5	2.2.2
Resistance to shear between the substrate and overlay	Asphalt concrete 160 °C (CBM)	2.2.6		P1, S1.2., T5	0,2 MPa
	Mastic Asphalt 250 °C (MA)			P1, S1.1, T5	0,34 MPa
Water-tightness (23 °C)		2.2.7		P1, S0, T5	Watertight
Resistance to high and low service temperatures	Low temperature	2.2.8	2.2.2	P1, S1+S2, T2	Watertight
	Bond strength to the support at +40 °C, -10 °C or -20 °C		2.2.1		NPA
	Resistance to shear to support (2.2.6) at +40 °C and/or -10 °C		2.2.6		NPA
Capacity to penetrate pores in the support		2.2.9			NPA
Resistance to flow (associated with the application to non-horizontal surfaces)		2.2.10		P1, S0, T5	0 %
Dry film thickness		2.2.11		P1, S0, T5	2.7 mm
Resistance to the effects of climatic conditions on application	Bond strength to the support 5 °C	2.2.12	2.2.1	P1, S0, T5	2.0 MPa A/B
	Bond strength to the support 40 °C				2.3 MPa A/B
Resistance to the effects of quality of the support (SC)	Moisture Content (MC)	2.2.13		P4, S0, T5	NPA
	Day Joints (OA) (24h/ 48h)				2.3 / 2.4 MPa A/B
	Section Joints (up to six months) (OA) (7d)				1.7 MPa A/B
Resistance to contact with water (Wa)	Variation in mass (edges sealed/ edges not sealed)	2.2.14		P1, S5.1, T5	0.17 / 0.18 %
	Micro hardness Initial/ageing (variation)				86° / 84° (-2 %)
Resistance to alkali solution contact (Al)	Variation in mass (edges sealed/ edges not sealed)	2.2.15		P1, S5.2, T5	0.3 %
	Micro hardness Initial/ageing (variation)				86° / 78° (-9 %)
Resistance to oil, petrol or, diesel contact		2.2.16			NPA
Resistance to bitumen contact (Bi)	Micro hardness Initial/ageing	2.2.17		P1, S5.3, T5	84°/81° (- 3 %)
Resistance to heat ageing (HA)	Capacity to bridge cracks	2.2.18	2.2.2	P1, S1+S2, T2	Watertight
	tensile stress (initial- ageing) 10 mm/min 23 °C / 1 mm/m -10 °C		2.2.18	P1, S0/S2, T5 / T3	19 / 24 MPa
	Elongation (initial- ageing) 10 mm/min 23 °C / 1 mm/m -10 °C		2.2.18		22 / 24 MPa
	Bond strength to the support		2.2.1	P1, S2, T5	210 / 331 % 228 / 301 % 2.4 MPa A/B

### 3.2 Hygiene, health and environment (BWR 3)

Basic requirement for construction works 3: Hygiene, health, and the environment		
Essential characteristic	Relevant clause in EAD	Performance
Content, emission and/or release of dangerous substances	2.2.20	NPA

### 3.3 Safety and accessibility in use (BWR 4)

Basic requirement for construction works 4: Safety and accessibility in use				
Essential characteristic		Relevant clause in EAD	Condition test	Performance
Bond strength (kit to overlay)	Mastic Asphalt (250 °C):	2.2.21	P1, S1.1, T5	1.3 MPa B/C
	Asphalt concrete (160 °C):		P3, S1.2, T5	0.64 MPa A/B
Slipperiness		2.2.22		NPA
Resistance to Abrasion / Wear		2.2.23		NPA

### 3.4 Durability due to climatic (BWR 1 and 4 (high and low temperatures))

Durability due to climatic Resistance to freeze/thaw (FT)				
Essential characteristic		Relevant clause in EAD	Condition test	Performance
Bond strength to support		2.2.24	2.2.1	P1, S3, T5
Resistance to shear to support / overlay MA				

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

### 4.1 System of assessment and verification of constancy of performance

According to the decision 2003/722//EC of the European Commission<sup>(1)</sup> the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) n° 305/2011) given in the following table applies.

Product	Intended uses	Level or Classes	System
IMPERMAX POLYUREA H FLEX	Liquid Applied Bridge deck Waterproofing	Any	2+

This system of attestation of conformity +2 is defined as follows:

**Tasks for the manufacturer:** Initial type-testing of the product, Factory production control and Testing of samples taken at the factory in accordance with a prescribed test plan.

**Tasks for the notified body:** Certification of factory production control on the basis of:

- Initial inspection of factory and of factory production control.
- Continuous surveillance (annual), assessment and assessment of factory production control.

<sup>(1)</sup> Official Journal of the European Communities L229/14 of 20.08.1997

## 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 which is deposited at IETcc<sup>2</sup>.

### 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. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan

**Initial type-testing of the product.** The initial type-testing have been conducted by the IETcc to issue this ETA in accordance with the EAD 030675-00-0107 Liquid applied Bridge Deck waterproofing Kits. The verifications underlying this ETA have been furnished on samples from the current production.

**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 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.

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

**Initial inspection of factory and of factory production control.** The Notified Body shall ascertain that, in accordance with the Control Plan, the factory (in particular the employees and the equipment) and the factory production control are suitable to ensure continuous and orderly manufacturing of the components according to the specifications mentioned in clause 2 of this ETA.

**Continuous surveillance, assessment and assessment of factory production control,** in accordance with the provisions laid down in the control plan, at least one per year.

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report. The notified certification body involved by the manufacturer shall issue an EC Certificate of factory production control stating the conformity of the provisions of this ETA.

In cases where the provisions of the ETA and its control plan are no longer fulfilled the notified certification body shall withdraw the certificate of conformity and inform to IETcc without delay.

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<sup>2</sup> The Control Plan is a confidential part of the ETA and only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

Issued in Madrid on 06 september 2021

By



Director

on behalf of Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc – CSIC)