RAYSTON
SYSTEMS
BY KRYPTON CHEMICAL



Building solutions

Fast and high performant waterproofing of bridge decks with seamless polyurea membrane

1. About Krypton Chemical S.L

Krypton Chemical, S.L. is a leading global company dedicated to the manufacture and commercialization of resins for the construction market, especially in the area of waterproofing applied in liquid form.
With presence in more than 50 countries on 5 continents and extensive R & D & I activity, the company designs and produces its own polyurethane, polyurea and epoxy resins through various technologies at its factory in l'Hospitalet de L'Infant.
Krypton Chemical accompanies its clients from the design of the most suitable solution for any project to the accreditation and certification of any system by recognized laboratories. Even with an on-site presence during the execution of the project to train and assist the professionals in the application of the systems, all with the aim of guaranteeing the quality of the commissioning.

Krypton Chemical, SL. markets the resins it manufactures under the RAYSTON brand.

2. Introduction

This document details the process of waterproofing a bridge deck in a fast and effective way, following the requirements of European regulations.
Concrete bridge decks can be easily affected by water leaks from the roadway, causing damage to the structure of the construction: rusting, fissures, cracks and finally disintegration of the material. To avoid these problems it is always necessary to waterproof the bridge deck with an high performant and long-lasting system.

3. Traditional waterproofing systems VS. Liquid, hot applied waterproofing (Polyurea)

Traditional waterproofing systems based on solid membranes are slow to install, labor intensive and do not guarantee a medium to long term watertightness. They always fail, the water ends up entering sooner or later through the joints that end up cracking.

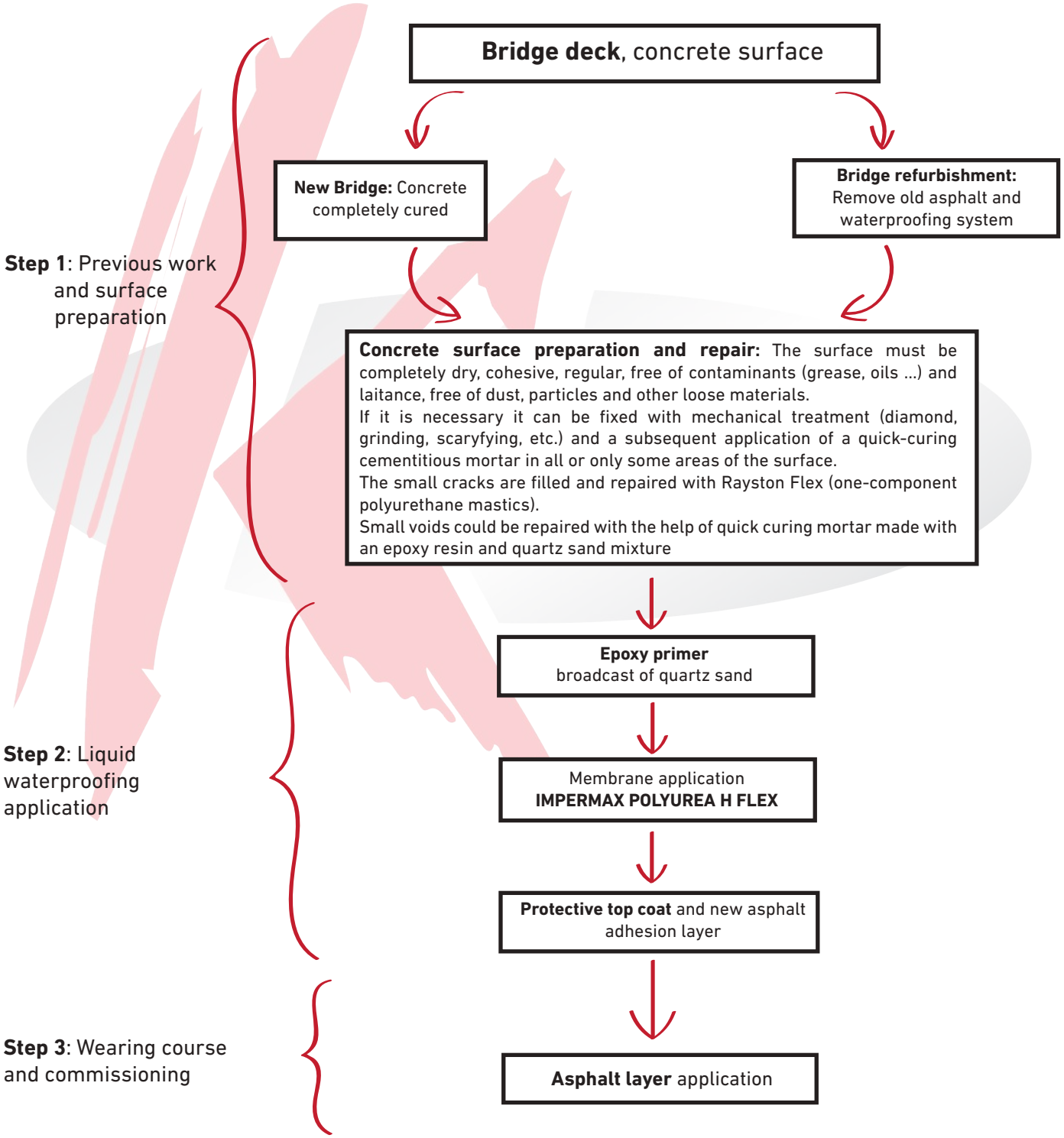




Waterproofing membranes applied in liquid form allow the creation of a continuous, compact, seamless system, fully adhered to the support to be protected. This can ensure total long-term waterproofing.
There are several types of resins applied in liquid form for this purpose. Recently introduced for that purpose, polyurea resins have been applied with a special hot spraying machine, allowing curing in a few seconds and high productivities of up to 800 m^2 per day and per machine.

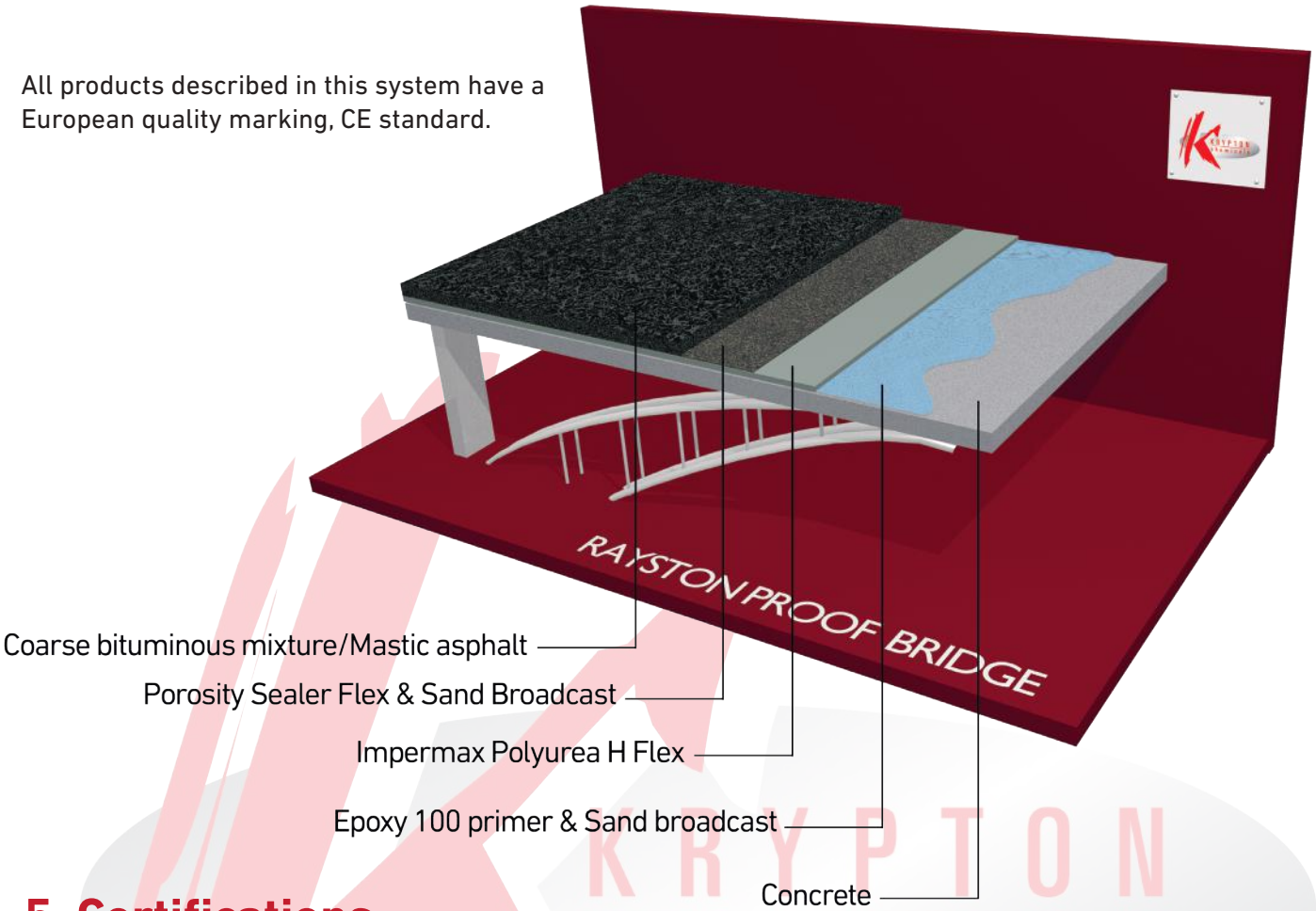
4. Description of the Krypton waterproofing process of bridge decks

IMPERMAX POLYUREA H FLEX polyurea resin, applied with a hot spraying machine, once cured forms a continuous, watertight, long lasting membrane with high elasticity and mechanical resistance. It presents a stability to hot mastic asphalt of up to 250°C. It is applied with a minimum thickness of 2 mm. For a correct waterproofing of the bridge deck it is necessary to follow the process indicated in this diagram:



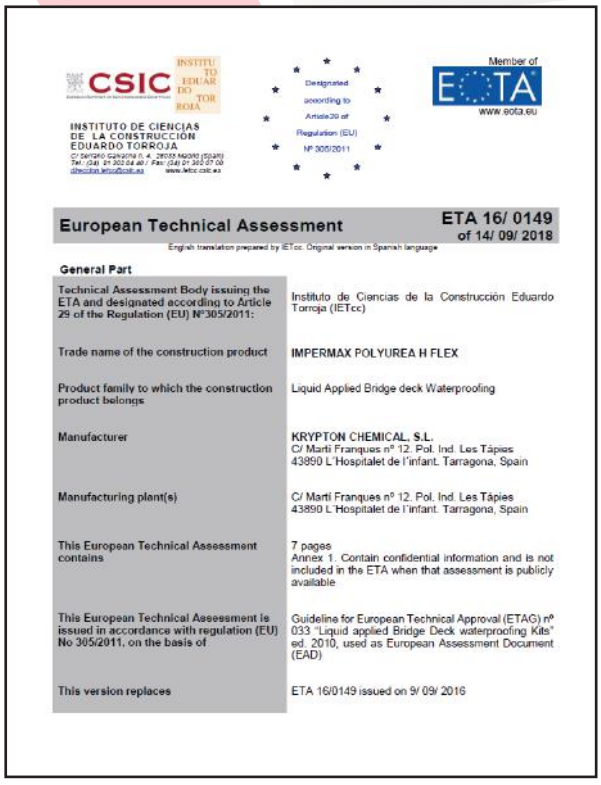
The following graphic shows the different stages of the waterproofing system:

All products described in this system have a European quality marking, CE standard.



5. Certifications

The system described here presents an ETA (European Technical Assessment) certificate nº 16/0149 of 14/09/2018 according to the ETAG 033 standard for the waterproofing of bridge decks (CE marking), European wide valid, confirmed by the EOTA (Brussels).



CSIC — INSTITUTO DE CIENCIAS DE LA CONSTRUCCIÓN EDUARDO TORROJA

Designated according to Article 20 of Regulation (EU) Nº 305/2011

Member of EOTA www.eota.eu

European Technical Assessment — **ETA 16/ 0149 of 14/ 09/ 2018**

English translation prepared by IETcc. Original version in Spanish language

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	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
Manufacturing plant(s)	C/ Martí Franques nº 12. Pol. Ind. Les Tàpies 43890 L'Hospitalet de l'infant. Tarragona, Spain
This European Technical Assessment contains	7 pages Annex 1. 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 033 "Liquid applied Bridge Deck waterproofing Kits" ed. 2010, used as European Assessment Document (EAD)
This version replaces	ETA 16/0149 issued on 9/ 09/ 2016

In order to obtain this certificate, the IMPERMAX POLYUREA H FLEX system has undergone harsh tests of mechanical resistance in extreme conditions, for example adhesion, ability to bridge over cracks before and after aging, resistance to perforation, thermal impact, impermeability, etc.
Also hard tests of chemical resistance, against alkaline solutions, the penetration of chloride ions and of course against the continuous contact with the asphalt components.

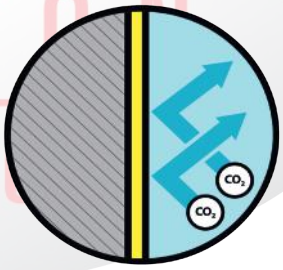
In short, the certificate ensures that the system can perfectly withstand service temperatures from -40°C to + 60 ° C, for a minimum of 25 years. The membrane thus created can be coated with concrete or mastic asphalt with a temperature of up to 250°C.

Finally, a mandatory annual inspection of the production system and quality control for the manufacture of all these resins, by the independent certifying laboratory, ensures that the high performances described in the certificate are always in force for all manufacturing batches.

The IMPERMAX POLYUREA H also has a certificate of fire resistance, according to German DIN 4102-1, "Flammability subject to the direct action of a flame", with classification B2.

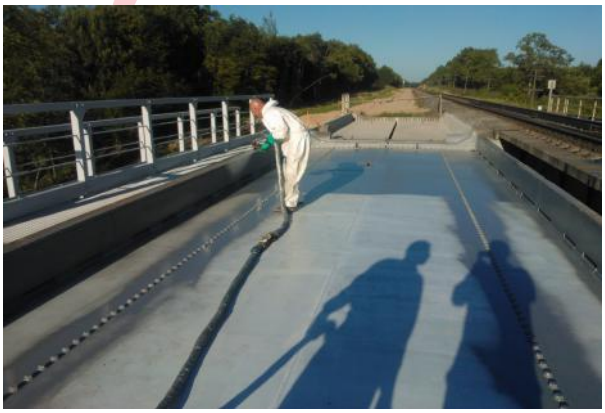
6. Other Krypton solutions for concrete structures

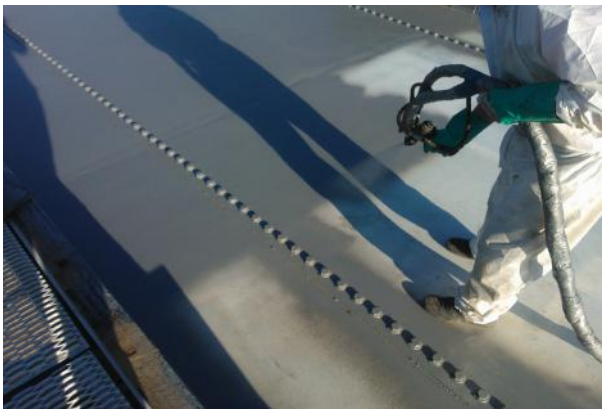
Either the waterborne ACRIMPER (acrylic) or the IMPERMAX AQUA (polyurethane based, with better performances and durability) are an ideal solution for the protection of concrete surfaces against carbonation. Both resins allow to create a coating of high elasticity, outdoors resistance and with a very low permeability to the CO2. They hold a certificate for the protection of concrete surfaces according to the European norm EN-1504-2 (CE Marking).



7. Our projects made all over the world

Several railway bridges in Latvia, 200 m^2 and 400 m^2





Bridge in Meydan Road, Dubai, 1300 m^2





Passarelle Debilly, Paris, 300 m^2





Bridge in Logroño 2000 m^2



Bridge in Soyola 450 m^2



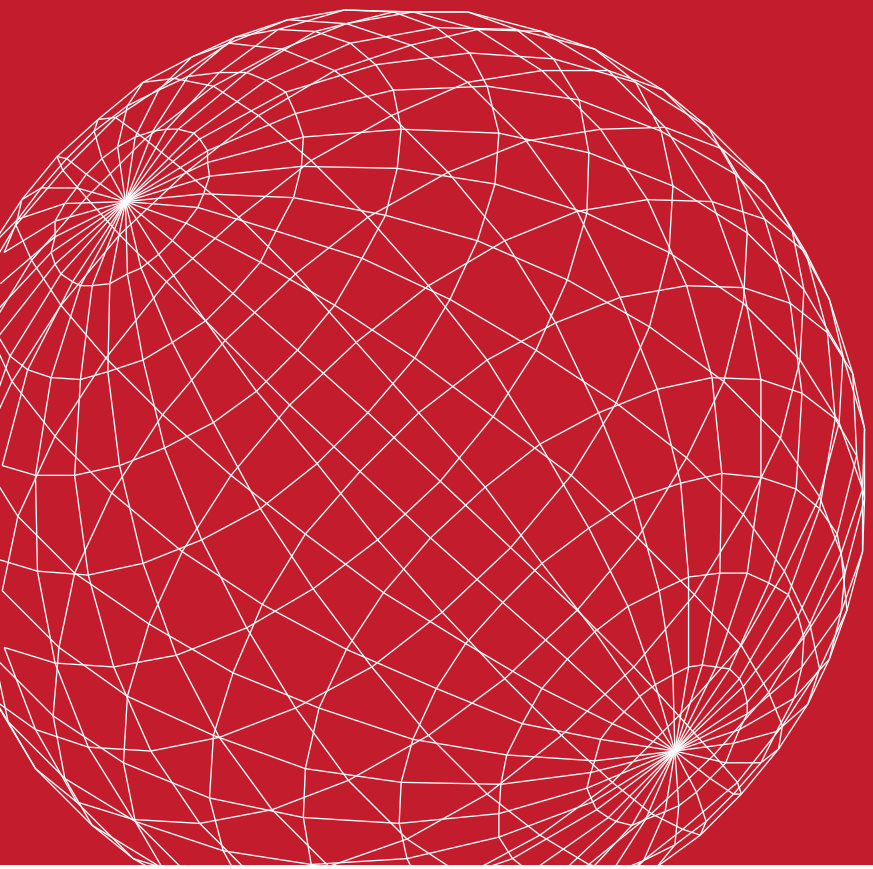
8. Conclusions

Krypton Chemical, SL. Proposes a novel solution for the waterproofing of bridge decks, based on the polyurea applied in liquid form using a hot spraying machine: IMPERMAX POLYUREA H FLEX.

This solution has the following advantages:

- Waterproofing membrane with very good mechanical, chemical and high temperature resistance.
- Elastic, continuous and seamless waterproofing membrane capable of resisting substrate movements (ability to bridge over cracks of the base concrete).
- System remains watertight at long them.
- Quick execution.
- The application thanks to an automated system allows to completely guarantee the quality of the work.
- System certified according to European standards (ETAG 033).
- References of works made all over the world.

Notes



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