



APPLICATION GUIDE.

Rayston Proof PUA X5

System

by Krypton Chemical

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1. General conditions

RECOMMENDATIONS

MANUFACTURER

The manufacturer of the products used in the work described in this specification shall demonstrate in writing that its Quality Assurance system complies with the requirements of Spanish Standard UNE-ISO 9001.

APPLICATOR

For the correct application of the systems specified in this report, it is recommended that the application company has successfully completed a training program on their installation or application and the appropriate methods for preparing the substrate. It must also have the necessary equipment for the correct application of the product. The application company must have the necessary means and equipment in suitable condition for the correct application of the system.

EXECUTION OF THE APPLICATION:

ENVIRONMENTAL CONDITIONS

Before starting the work described in this specification, check that the environmental conditions, the site, and the substrate are suitable for the application.

The final responsibility for any decision regarding the application of the system on site shall lie with the site manager, project manager, and/or builder, and in no case with the product supplier.

PREPARATION

Proper preparation of the substrate is vital for the correct application of the products. Therefore, the technical instructions recommended by the manufacturer must be followed.

APPLICATION

It is recommended that the products described in this report be applied or installed in accordance with the manufacturer's instructions and in compliance with current regulations.

PROTECTION SYSTEMS

Before starting the application work, the necessary measures must be taken to protect workers in terms of Occupational Risk Prevention, and the appropriate measures must be taken to ensure that personnel not involved in the work are not affected by the application.

2. Proposed solution

This document is intended to assist you and the applicator during the application of the **RAYSTON PROOF PUA X5** system. High-performance liquid waterproofing system, applied by hot spray machine on concrete, which when applied forms a thick, continuous, elastic and flexible coating that can increase its volume up to 5 times (foamed coating). This increase in size helps to fill all types of gaps and differences in height on uneven (well-dried) surfaces of different types.

To do this, the preliminary actions to be carried out on the wall must be defined in order to mitigate the risk of future damage. In addition, we will take into account the minimum properties that the substrate must meet in order to mitigate future risks.

3. System steps

The system must follow these steps:

- Sprayed membrane: Rayston X5 Polyurea
- Top coat: Colodur.

[FT flashing](#)

4. Substrate requirements and treatment of details and specific points

1 Substrate requirements

The cementitious mortar substrate must meet the following properties:

- Compressive strength (minimum 25 N/mm²)
- Minimum cohesion (resistance to tearing/traction) of 1.5 N/mm².



- HR <4%
- No cracks
- Cohesive
- Uncontaminated
- Level

(Otherwise, the coating will highlight any existing irregularities)

2 Moisture content, ambient temperatures, and substrate.

It is important to monitor ambient temperatures and humidity throughout the application cycle to prevent accelerated reactions.

The substrate must be as dry as possible.

Recommended ambient temperature conditions: Min. +10°C, Max. +30°C.

Always apply (each layer of the treatment) to a substrate whose temperature is 3°C above the dew point (to prevent condensation of ambient humidity on the substrate).

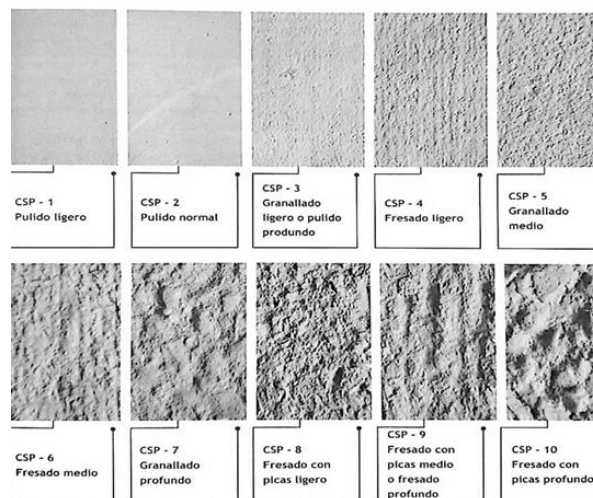
3 Substrate preparation:

To ensure good compatibility of the system with the existing substrate and to obtain good adhesion, it is very important that the substrate meets the minimum conditions and has the following properties:

1. Cohesive.
2. Regular and homogeneous.
3. Completely continuous.
4. Free of cracks, fissures, and cavities (which must be treated beforehand).
5. Clean and free of dust, grease, fluids, and any other type of chemical contaminant.
6. Fully cured.
7. Free of particles and other materials not completely adhered to the substrate.
8. As dry as possible (without risk of negative pressure).

The substrate must be washed with a high-pressure water jet to remove dirt (degreasing) and impurities. It is important that no material residues remain, as these can affect the adhesion of the membrane to the substrate.

The degree of roughness in the concrete must be CSP1-CSP3 according to Technical Guide No. 03732 of the ICRI (International Concrete Repair Institute) "Selection and Specification of Concrete Surface Preparation for Polymeric Coatings, Sealants, and Linings."



4 Treatment of damage and impact marks:

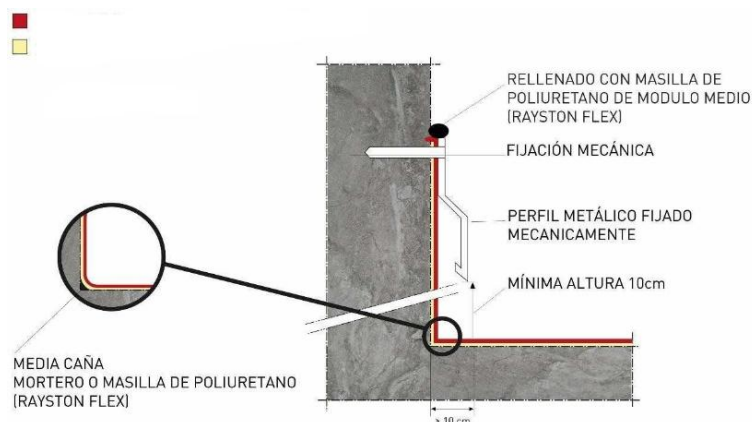
Before proceeding with the primer on the surface, local treatments will be carried out with dry mortar based on Rayston Epoxy 100 resin, with aggregate of 0.4 to 0.9 mm grain size or equivalent, or with R4-type cementitious repair mortar, ensuring complete aesthetic homogeneity with the existing treatment. Any cracks or small cavities will be filled with Rayston Flex polyurethane putty or equivalent.

5 Treatment of details and specific points:

Right angles should be avoided at horizontal-vertical joints, corners, and other parts of the structure; in other words, it is advisable to round off these areas of the surface with mortar (**half-rounds**).



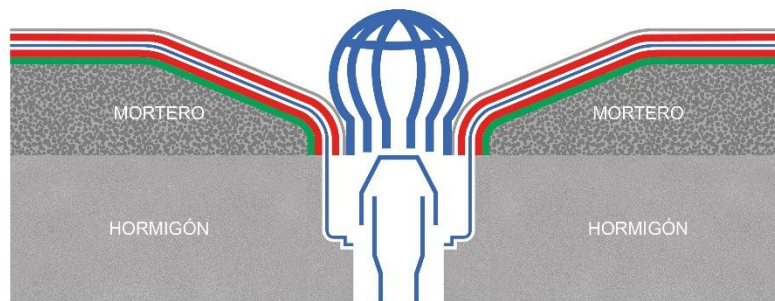
To **prevent delamination** of the polyurea membrane at the edges of the treatment, it should end about 15-20 cm from the floor on the vertical part. At this point, a groove will be cut with the help of a radial saw. The edge of the membrane will end inside this groove. This edge of the membrane must then be protected with a Rayston Flex-type polyurethane mastic. The installation of an aluminum protective profile will prevent possible detachment of the edge of the membrane in the medium and long term.



In **drains**: Remove the cover or gravel, clean with pressurized water, and once dry, apply the primer as a bonding bridge. Allow to cure, and spray the membrane, completely covering the drain wing and facilitating its entry into the water collection basin.

Note: As this is an expansive polyurea, care must be taken not to cover the drains.

■ PRIMER
■ POLYUREA
■ CAZOLETA
■ TOP COAT



With regard to the **expansion joints** in the structure, if they have a movement greater than 50% of the size of the joint, mechanical joints must be installed (for example, a joint with a minimum width of 10 cm must open a maximum of 15 cm). To ensure the watertightness of the system, these mechanical joints must be installed following the manufacturer's specific recommendations.

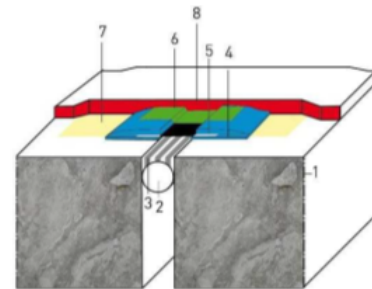
If the movement is smaller, it can be treated with Rayston Joint Geo high elasticity tape, after filling it appropriately (polyethylene foam cylinder and Rayston Flex type polyurethane putty). Rayston Joint Geo adheres to the primed substrate thanks to an adhesive (2K PU Adhesive) or an epoxy resin such as Rayston Epoxy 100 applied to the geotextile attached to the tape. Polyurea membranes do not adhere well to Rayston Flex Joint Geo tape, so if the joint moves, this movement will not be transferred to the polyurea membrane, or in any case the movement will be attenuated when it reaches the polyurea membrane, reducing the risk of cracking.

Rayston Joint Geo can be supplied in different widths; it is advisable to always use a strip of the appropriate width.

For small jobs, Rayston Flex 3040 single-component polyurethane mastic should be applied manually. For greater productivity, the highly elastic polyurea-based mastic (two-component, cures in a few seconds) Rayston Flex 70 can be applied as an alternative using the portable Rayston Spray Gun machine. If a large number of linear meters of joint need to be filled, application will be more efficient with the Rayston G-1 machine.

A similar treatment should be carried out on cracks larger than 2 mm or even smaller if there is a suspicion that they are moving and/or continuing to open over time (unstabilized cracks or fissures).

1. REGULAR, DRY AND FULLY CURED CONCRETE SURFACE.
2. JOINT BOTTOM: POLYURETHANE FOAM CYLINDER (PE).
3. RAYSTON FLEX 3040 / RAYSTON FLEX 70
4. PU 2K ADHESIVE OR RAYSTON EPOXY 100
5. RAYSTON FLEX JOINT GEO
6. SEPARATION STRIP (PE) - RAYSTON FLEX JOINT (OPTIONAL)
7. PRIMER
8. WATERPROOFING MEMBRANE APPLIED IN LIQUID FORM



Important: Treatment carried out in winter (at the lowest possible temperatures) will always be more effective than treatment carried out in summer. In winter, at low temperatures, the materials will be contracted and the edges of the joint will be further apart. In summer, with high temperatures, the materials will be expanded and the edges of the joints will be closer together. If the treatment is carried out in summer, without leaving any slack in the membrane, when winter arrives and the environment cools down, the edges of the joints will separate and the membrane will become tense, with the risk of cracking.

In typical situations such as air conditioning **ducts**, a metal chimney that emits hot gases, or metal/plastic pipes passing through mortar or concrete/metal structures, we will apply Rayston Tape adhesive tape:



5. Steps and application of the system

5.1 Main membrane

Rayston X5 Polyurea has an elastomeric formulation of expansive polyurea. Resistant and flexible, it can expand its initial thickness by 3 to 5 times. It is used to prepare the substrate on uneven surfaces or those with critical points. With the exception of special cases, it does not normally require any primer.

Apply approximately 1-1.5 kg/m² of Rayston X5 Polyurea.

Mix the contents of the pigment paste (component C, white plastic bucket, 4 kg) with a mixer to prevent air from entering. Add component C to component A (blue drum). Stir and homogenize using suitable electric mixing equipment before loading into the machine (low-speed mixer to prevent air entering the resin). Recirculate both components (A and B) while heating to the required application temperatures.

The recommended conditions for the dosing machine are:

1:1 (volume ratio)

Component A temperature: 60°C

Component B temperature: 60°C

Pressure should be set to 100-120 bar.

Recommended spray gun: Master II type (Gama)

For an optimal top coat, apply the recommended amount (specific to each project) in two successive coats: a very thin first coat (150-250 g/m²), and the rest of the amount 5-10 minutes later.

5.2 Top coat

Apply (roller or airless machine) 0.3 kg/m² of **Colodur**. To improve adhesion between Rayston X5 Polyurea and Colodur, this final coat should be applied shortly after applying Rayston X5 Polyurea. Ideally, the application should be carried out by two different teams working in parallel.

Rayston X5 Polyurea yellows and darkens very quickly when exposed to sunlight, so it will be easier to cover it if this is done shortly after application. This is particularly important if the required top coat is light-colored or white.

Colodur is a single-component aliphatic polyurethane resin with a solvent base. Applied in white, it has high reflective properties. The "cool roof" system, with an SRI of around 105, increases thermal comfort inside the building, especially in summer.

6. Certificates

POLYUREA RAYSTON X5 Certificates

The Impermax Polyurea X5 product has been thoroughly tested by several leading external laboratories, which have carried out the following tests:

- CE marking according to EN-1504 for the Rayston X5 Polyurea + Impermax A system.
- Broof(t1) for Rayston X5 Polyurea + Impermax A system.
- Asbestos encapsulation with Rayston X5 Polyurea + Impermax A or Colodur Pigmented system.
- Other performance tests carried out by independent laboratories:
- Thermal conductivity.
- Adhesion to dry concrete. With primer (Rayston Epoxy 100) and directly on the substrate, without primer.
- Crack resistance: class A5 (static, the highest possible rating), with a thickness of 6.5 mm.
- Dynamic puncture resistance according to EOTA, class P3 to TH3 (80°C).
- Watertightness (liquid water) according to EOTA (TR 003).

Colodur Certificates

The Colodur product has been thoroughly tested by the Applus Laboratory in the following tests:

- Adhesion resistance, UNE-EN 13892-8:2003
- Impact resistance, UNE-EN ISO 6272-1:2012
- BCA wear resistance, UNE-EN 13892-4:2003
- Determination of the slip resistance value
slip resistance of unpolished flooring (USRV). UNE-ENV 12633:2003, Annex A.
- Abrasion resistance TABER s/n UNE 48250
- Scratch resistance s/n UNE EN ISO 1518
- Resistance to liquids (motor oil and diesel fuel) n/a UNE EN ISO 2812-3 and UNE EN ISO 2812-4
- Resistance to staining by contact with vulcanized rubber
- Gloss determination s/n UNE EN ISO 2813
- Water vapor permeability, UNE EN ISO 778-1 and UNE EN ISO 7783-2

7. Maintenance

It is advisable to maintain the installations and carry out periodic cleaning, removing surface residues and dirt before cleaning.

A minimum frequency of two visual inspections per year is recommended, one at the beginning of spring and the other at the beginning of fall.

In addition, the roof should always be inspected after other professionals have carried out work such as construction, installation of new equipment, or repair of existing equipment.

8. Conclusions

The **RAYSTON PROOF PUA X5** system proposed by Krypton Chemical has been used in a large number of construction and roof renovation projects in Spain and other countries. It has a long track record of success.

This system is completely continuous (without joints), remains adhered to the treated surface, and offers great resistance over time. In addition, it is a system that easily and effectively resolves all the unique issues that can be encountered in an installation of this type.

This system, applied on site by a company approved by Krypton Chemical, has CE marking based on tests carried out by the APPLUS laboratory.

The proposed top coat system will improve performance, appearance, and aesthetics in the long term.

The information contained in this document, as well as the advice given by Krypton Chemical, SL professionals, whether in writing, orally, or through testing, is provided in good faith based on our experience and the results obtained through tests carried out by independent laboratories. However, it does not serve as a guarantee for the applicator, who should take it as a reference only and for informational purposes. We recommend that you study this information in depth before proceeding with the selection, use, and application of any of these products. It is advisable to carry out tests "in situ" to determine the suitability of a treatment on site. Our recommendations do not exempt the applicator from the obligation to have in-depth knowledge of the correct method of application of these systems before proceeding with their use, as well as to carry out as many tests as necessary in case of doubt about their suitability for any work, installation, or repair, taking into account the specific circumstances in which the product will be used. Krypton's obligations are those established by Law 38/1999 on Building Regulations in Article 15 in its capacity as a product supplier. Under no circumstances is it assumed that Krypton is assuming the responsibilities and obligations corresponding to the site manager, construction manager, and builder as established by said law.

The obligations enforceable against Krypton shall only be those that can be claimed from a product supplier. Under no circumstances, through this or any other document, does Krypton assume the responsibilities and obligations corresponding to the project manager, the construction manager, or the builder.

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