

RAYSTON FIRE E



Pure polyurea membrane, for special waterproofing projects. Applied with a proportioning machine. Fire resistant.

DESCRIPTION

Rayston Fire E is a pure polyurea resin, totally free of solvents. Spray applied with a proportioning machine (ratio 1:1 in volume). Once cured, it forms a continuous and seamless high performant membrane, chemical, fire and outdoors resistant, that has got a thermosetting and elastomeric behaviour (hard and elastic at the same time). The membrane cures in a few seconds and returned to service in a matter of hours.

APPLICATIONS

Protective and waterproofing coating for concrete structures (both exterior and interior, for example, in tunnels). Protective coating for metal structures and polyurethane insulating foam.

PROPERTIES

- Fully continuous membrane, hard, elastic, and flexible. High puncture and compression resistant, able to bridge over cracks in the support.
- Very fast curing, using two-component spraying equipment.
- Outstanding fire resistance. Does not spread fire.

CERTIFICATIONS

- Reaction to fire classification according to EN-13501-1: **B-s2-d0** (over non-combustible support).
- Environmental Product Declaration, registration number EPD-IES-0019755.
- External fire performance according to UNE-EN 13501-5: Classification BROOF(t4).



TECHNICAL DATA

INFORMATION ON THE PRODUCT BEFORE APPLICATION

	Component A	Component B	Component C
Chemical description	Polyamine	Aromatic isocyanate prepolymer	Complex blend of flame retardants
Physical state	Liquid	Liquid	Fine powder
Packaging	Metal container 172 kg	Metal container 215 kg	Metal container 2 x 21,5 kg
Non-volatile content	100%	100%	100%
Colour	Dark yellow	Yellow	White
Flash point	>100°C	>100°C	n/a
Density	1.22 g/cm ³	1.12 g/cm ³	1.9 g/cm ³
Viscosity	1700-1900 mPa.s	600-900 mPa.s	n/a
Mixing ratio	A+C = 1, B = by volume		
Mixture properties	Fast polymerization (see pot life data)		
Curing performance	Gel time: 6-8 seconds at 25°C Walkable: >15 minutes Light traffic: >8 hours Complete curing: >24 hours		
Storage	Keep between 10°C and 30°C		

INFORMATION ON THE FINAL PRODUCT

Final state	Elastomeric solid membrane
Colour	Available colours: light grey, dark grey, rust red, blue (may darken during storage and exposure to sunlight). Other colours under request.
Hardness (Shore)	92-95A, 35-40D (ISO 868)

Mechanical properties	Maximum elongation: 275-285% Tensile strength: 10-11 MPa (UNE EN ISO 527-1/3)
Tear strength	51 N/mm (ISO 34-1)
Water vapour resistance factor	$\mu = 1216$ (EN-ISO 7783: 2012)
Liquid water permeability	$W = 0.002 \text{ Kg/m}^2 \times \text{h}^{0.5}$ (EN-1062-3: 2018)
Watertightness (60kpa, 6 meters of water column)	Watertight (EN 1928)
Foldability at low temperature (-45°C)	Does not break or crack (EN-495-5)
Impact resistance	24.5 N x m, Class III > 20 N x m (EN ISO 6272-1)
Crack bridging properties (static)	Class A5, -10°C (EN-1062-7, Method A)
Vicat softening temperature	118°C (EN-ISO-306)

Adherence to a standard concrete substrate	2.8 Mpa with Rayston Epoxy 100, 3.9 Mpa with Primer GC (EN-1542)
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Solid film density	1.15 g/cm ³
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UV resistance	Rayston Fire E is an aromatic isocyanate-based product. A colour change is to be expected under sunlight (yellowing). This change does not affect its mechanical properties. An additional UV protection can be provided with an Impertrans/Colodur pigmented topcoat.
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Heavy metal content (mg/kg)	Selenium (Se): <1 Arsenic (As): 1.5 ± 0.3 Cadmium (Cd): <0.1 Cobalt (Co): <1 Chromium (Cr): <1 Mercury (Hg): <0.1 Nickel (Ni): <1 Lead (Pb): <1 Antimony (Sb): <1
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SUPPORT REQUIREMENTS

To achieve a good penetration and bonding, support must be:

- Flat and levelled.
- Compact and cohesive (pull off test must show a minimum resistance of 1.5 Mpa).
- Even and regular surface.
- Free from cracks and fissures. If any, they must be previously repaired.
- Clean and dry, free of dust, loose particles, oils, organic residues, silicones, or laitance.

Support moisture must be less than 4%.

Otherwise, a porous substrate must be treated with a special epoxy primer (Humidity Primer or preferably Primer GC).

Higher moisture content over the support does not prevent correct polymerization but may make adhesion increasingly difficult to substrates.

Metal substrates must be clean and free of dust, rust, oils, greases, non-well-adhered old paints or other loose materials.

TEMPERATURE AND HUMIDITY CONDITIONS

Air temperature should be between 10°C and 40°C. Relative air humidity should be less than 85%.

Temperature of the surface must be always at least 3°C higher than the dew point, to prevent condensation over the surface.



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SUPPORT PREPARATION

Concrete substrates must be prepared mechanically using high pressure sand or abrasion, to remove the surface and obtain an open pore.

Substrates must be primed and levelled until a regular surface is obtained.

Sharp irregularities are eliminated using an abrading disc machine.

Eliminate all dust and loose particles from the substrate by brushing or vacuum cleaning.

Over dry porous support, it is recommended to apply two layers of epoxy (Rayston Epoxy primer), to be sure that the porosity is completely sealed and to improve the adhesion over the support.

First one as such (or diluted with Rayston solvent) and the second one with quartz sand broadcasted over.

Prior to the application, metal substrates should be cleaned, degreased and primed with PU Primer or alternatively with a suitable anti-rust primer (PU ZN Primer).

MIXING

Stir and homogenise separately both components using suitable mixing equipment before being loaded into the machine. Add the required Pigment Spray and Component C (powder) to the A-component and stir before loading. Recirculate both components while heating up to the required application temperatures.

APPLICATION AND RECOMMENDED QUANTITIES

Rayston Fire E must be applied using 2-component hot spraying equipment. Recommended temperatures are:

- Component A: 70°C.
- Component B: 70°C.
- Hose: 70°C.

Pressure must be adjusted to 140 bar.

During spraying, check coating thickness and ensure that curing evolution is correct.

Rayston Fire E is applied at 1.5 g/cm³ in a single layer, obtaining a 1.5-2 mm thickness.

Please contact Krypton Chemical for specific application details.

RECOATING

It is recommended to obtain the right thickness with a single application. Where an epoxy primer has been previously applied, spray Rayston Fire E only after the primer is fully cured.

RETURN TO SERVICE

Under most conditions (25°C, 50% rh), the membrane is rain-resistant after 15 minutes.

TOOL CLEANING

To keep equipment in good conditions (spraying gun, gaskets), it is recommended not to use solvents. A cleaning fluid like Rayston Fluid can be used instead. Component B must be thoroughly removed and replaced with this fluid.

FAQ

Problem	Question	Answer	Solution
Does not cure or remains sticky	Ratio A/B correct?	Different pressure	Check and correct pumping equipment

Bubbles or open holes in the membrane	Porous substrate?	No primer	Apply an Epoxy-type primer before Polyurea. Open holes are frequent with fast-curing polyurea
Not enough hiding power	Horizontal?	Too few / No pigment	Use 1 kg/m ² minimum. Mix and homogenise pigment in component A before spraying.
Gray colour darkens upon exposure to sun	Exposed?	Components react with UV light.	Apply an aliphatic pigmented topcoat afterwards (e.g. Impertrans, Colodur)

SAFETY

Component B of Rayston Fire E contains isocyanates and Component A contains corrosive polyamines that can cause burns. Always follow the safety instructions in the Material Safety Data Sheet. As a rule, a good ventilation, protective clothing and respiratory protection is needed (combined organic vapor filters + particles A2P). This product must be used only for the applications here described. This product is intended for industrial and professional use. It is not suitable for DIY-type applications.

ENVIRONMENTAL PRECAUTIONS

Empty containers must be handled with the same precautions as if they were full. Treat empty containers as hazardous waste and transfer them to an authorized waste manager. If the containers still have some material left, do not mix with other product with no knowledge of potentially dangerous reactions. Component A and B may be mixed on a 1/1 ratio in order to get an inert material, but never do it in volumes larger than 5 litres in order to prevent a dangerous heat evolution.

OTHER INFORMATION

The information contained in this DATA SHEET, as well as our advice, both written as verbal or provided through testing, are based on our experience, and they do not constitute any product guarantee for the installer, who must consider them as simple information.

We recommend to study deeply all information provided before proceeding to the use or application of any of our products and strongly advise conducting tests "on-site" to determine their convenience for a specific project.

Our recommendations do not exempt of the obligation of installers to deeply study the right application method for these systems before use, as well as to conduct as many preliminary tests as possible should any doubt arise.

The application use and processing of our products are beyond our control, and therefore under the exclusive responsibility of the installer. In consequence, the installer will be the only responsible of any damage derived from the partial or total in-observation of our indications, and in general, of the inappropriate use or application of these materials.

This data sheet supersedes previous versions.



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