Polyurea Rayston

POLYUREA MEMBRANE
FOR WATERPROOFING IN SPRAY APPLICATIONS
EXTRA FAST CURING

DESCRIPTION
Polyurea Rayston is a 2-component polyurea system for elastic membrane application with crack-bridging capability. It is a extra fast-curing system that can only be applied by hot mechanical spraying equipment. Polyurea Rayston can be combined with different geotextiles to obtain on site applied, seamless liners.

APPLICATIONS
Waterproofing of non traffic areas and concrete structures. Application on traffic areas is posible with an additional topcoat protection. Roof waterproofing. On-site applied liners, totally seamless, for secondary containment applications, ponds, landfills, tunnels, canals, dam repairing. Polyurea Rayston can be completed with an aliphatic polyurethane topcoat to ensure UV protection.

PROPERTIES
CERTIFICATIONS

Applus (Independent laboratory):
Drinking water certification (Migration test). 928/09/8505
Low-temperature foldability: 11/2855-1313
Mechanical properties: 11/2855-1314
Dynamic and Static indentation test according to EOTA. 11/2855-1315


Technical Data

INFORMATION ON THE PRODUCT BEFORE APPLICATION

<table>
<thead>
<tr>
<th>Component A</th>
<th>Component B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical description</td>
<td>Polyamine</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Packaging</td>
<td>Metal container 184 kg</td>
</tr>
<tr>
<td>Note: Pigment is delivered in a third container. See Pigment Spray data sheet for specific details.</td>
<td></td>
</tr>
<tr>
<td>Non-volatile content (%)</td>
<td>100</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;100ºC</td>
</tr>
<tr>
<td>Colour</td>
<td>Yellow (without pigment)</td>
</tr>
<tr>
<td>Density (g/cm³)</td>
<td>Temperature (ºC)</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>Viscosity (mPa.s)</td>
<td>Temperature (ºC)</td>
</tr>
<tr>
<td></td>
<td>600</td>
</tr>
<tr>
<td>Temperature (ºC)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>2800</td>
</tr>
</tbody>
</table>
A/B ratio

<table>
<thead>
<tr>
<th></th>
<th>70</th>
<th>40</th>
<th>70</th>
<th>200</th>
</tr>
</thead>
</table>

A=100, B=117 by weight
A=100, B=100 by volume

Density and viscosity of the AB mixture
Fast polymerisation (see pot life data)

Colour
Dark yellow, but component A is pigmented by addition of pigment paste (Pigment Spray) delivered with each kit of Polyurea Rayston.

Pot life
Gel time mixture A+B (20 g)
4 s at 25°C
3 s at 60°C

Storage
Keep between 10° and 30°C

Use before
9 months after manufacturing date

**INFORMATION ON THE FINAL PRODUCT**

Final state
Elastomeric solid membrane

Colour
Available Pigment Spray pastes are blue RAL 5015, gray RAL 7011, Tile red, Beige RAL 1001, Other pastes are available under request.

Gloss (60°)
80-85

Hardness
Shore, ISO 868
87 A

Mechanical properties

<table>
<thead>
<tr>
<th>Elongation (%)</th>
<th>50</th>
<th>100</th>
<th>200</th>
<th>300</th>
<th>324</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength (MPa)</td>
<td>9.8</td>
<td>11</td>
<td>13</td>
<td>15.5</td>
<td>16.2</td>
</tr>
</tbody>
</table>

Maximum elongation: 324%
Tensile strength: 16.2 MPa
(UNE EN ISO 527-1/3)
Tear strength 61.8 N/mm
(UNE EN ISO 527-1/3)
Chemical resistance
(0=not recommended, 5=best)

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Conditions</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>15d, 80ºC</td>
<td>5</td>
</tr>
<tr>
<td>Salt water (saturation)</td>
<td>15d, 80ºC</td>
<td>5</td>
</tr>
<tr>
<td>Xylene</td>
<td>7d, 80ºC</td>
<td>2</td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td>7d, 80ºC</td>
<td>1</td>
</tr>
<tr>
<td>Isopropyl alcohol</td>
<td>7d, 80ºC</td>
<td>0</td>
</tr>
<tr>
<td>Sodium hydroxide (40 g/L)</td>
<td>7d, 80ºC</td>
<td>5</td>
</tr>
<tr>
<td>Hydrogen peroxide (33%)</td>
<td>7d, 25ºC</td>
<td>4</td>
</tr>
<tr>
<td>Sulphuric acid (10%)</td>
<td>7d, 80ºC</td>
<td>5</td>
</tr>
<tr>
<td>Sulphuric acid (30%)</td>
<td>30d, 80ºC</td>
<td>4</td>
</tr>
<tr>
<td>Bleach</td>
<td>7d, 80ºC</td>
<td>4</td>
</tr>
<tr>
<td>Ammonia (3%)</td>
<td>7d, 80ºC</td>
<td>5</td>
</tr>
<tr>
<td>Diesel</td>
<td>16d, 80ºC</td>
<td>5</td>
</tr>
</tbody>
</table>

Adhesion strength

<table>
<thead>
<tr>
<th>Surface</th>
<th>Adhesion strength (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>&gt;50</td>
</tr>
</tbody>
</table>

UV resistance
Polyurea Rayston is an aromatic isocyanate based product. A colour change is to be expected under sunlight. This change does not affect its mechanical properties. An additional UV protection can be provided with an Impertrans/Colodur topcoat.

Thermal resistance
Stable up to 80ºC. According to low temperature tests, (UNE_EN 495-2001), the membrane can be folded at -45ºC without cracking or breaks.

Indentation
Polyurea Rayston gives, at 2-mm thickness, a resistance to indentation equivalent to a p4 level (approx 25 kg/cm2) at TH4 (90ºC) as directed by EOTA guide ETAG 005.

The combined liner of Polyurea Rayston +selected geotextiles gives an static indentation resistance higher than 4000 kN (UNE-EN ISO 12236:2007)

APPLICATION GUIDELINES

Recommended combinations
C1
1 Rayston Epoxy Primer, one or two coats 200-300 g/m2, 24 hours drying
2 Polyurea Rayston
3 (Option: Colodur, 200-300 g/m2, pigmented as UV protective topcoat)

C2
Geomax geotextile
Polyurea Rayston

Support requirements
In order to achieve a good penetration and bonding, support must be:
1. Flat and leveled
2. Compact and cohesive (pull off test must show a minimum resistance of 1,4 N/mm2).
3. Even and regular surface
4. Free from cracks and fissures. If any, they must be previously repaired.
5. Clean and dry, free of dust, loose particles, oils, organic residues or laitance
Support temperature must be between 10°C and 40°C. Support moisture must be less than 4%.

**Temperature and humidity conditions**

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

**Support preparation**

Concrete substrates must be prepared mechanically using high pressure sand or abrasion, in order 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. If underlying moisture is suspected, it is recommended to apply 2 coats of epoxy (Rayston Epoxy primer). First one as such and the second one with quartz sand spreaded over.

**Mixing**

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

**Application and recommended quantities**

Impermax 2K must be applied using a 2-component hot spraying equipment. Recommended temperatures are:

- Component A: 55-65°C
- Component B: 65-70°C

Pressure must be adjusted to 140 bar.

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

Polyurea Rayston is applied at 1.5-2.0 kg/m², obtaining a 1.5-2 mm thickness.

Please contact Krypton Chemical for specific application details.

**Curing time**

Polyurea Rayston cures to touch after a few minutes after application. Approximate hardness values are provided here as reference only (1 mm, polypropylene support, 25°C 50% RH)

<table>
<thead>
<tr>
<th>Time</th>
<th>Hardness Shore A</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min</td>
<td>28</td>
</tr>
<tr>
<td>10 min</td>
<td>40</td>
</tr>
<tr>
<td>20 min</td>
<td>55</td>
</tr>
<tr>
<td>1h</td>
<td>70</td>
</tr>
<tr>
<td>24 hours</td>
<td>80</td>
</tr>
<tr>
<td>4 days</td>
<td>88</td>
</tr>
</tbody>
</table>

**Re-coating**

It is recommended to obtain the right thickness with a single application. If a second coat is necessary, spray it immediately after the first one.

Where an epoxy primer has been previously applied, spray Polyurea Rayston only after the primer is fully cured.

**Return to service**

Under most conditions (25°C, 50% rh), the membrane is rain-resistant after 10
minutes.

Tool cleaning

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

Cleaning and maintenance

A maintenance work must be carried out regularly on the treated roofs according to the intended use.

This work includes the following tasks:

- Leaf removal
- Grass, dirt, moss and other vegetation removal
- Keeping storm water system in good working order.
- Ensure gratings are in place, in order to prevent gutter obstructions.
- Check proper condition of several structures (flashing, seams, retaining walls...)
- Verification of possible damages due to improper use.

If aesthetic appearance of the roof is an important issue, it is essential to regularly clean the surface with water (*some mild detergent may be added*), according to the use.

It may be necessary to reapply decorative layers (Impertrans, Colodur) if they are worn out due to traffic, weather, corrosion, etc.

For stain removal, a surface treatment with Rayston solvent or isopropyl alcohol may be attempted. Strong acids are totally inadequate. Some solvents may damage the membrane. If this happens, the affected area has to be cut and repaired with a new Polyurea Rayston application

### FAQ

<table>
<thead>
<tr>
<th>Problem</th>
<th>Question</th>
<th>Answer</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not cure or remains sticky</td>
<td>Ratio AB correct?</td>
<td>Different pressure</td>
<td>Check and correct pumping equipment</td>
</tr>
<tr>
<td>Bubbles or open holes in the membrane</td>
<td>Porous substrate?</td>
<td>No primer</td>
<td>Apply an Epoxy-type primer before Polyurea</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Open holes are frequent with fast-curing polyurea</td>
</tr>
<tr>
<td>Not enough hiding power</td>
<td>Horizontal?</td>
<td>Too few No pigment</td>
<td>Use 1 kg/m² minimum Mix and homogeneize pigment in component A before spraying</td>
</tr>
<tr>
<td>Gray colour darkens upon exposure to sun</td>
<td>Exposed?</td>
<td>Components react with UV light</td>
<td>Apply an aliphatic topcoat afterwards (Impertrans, Colodur)</td>
</tr>
</tbody>
</table>

### Safety

Component B of Polyurea Rayston 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 general rule, a good ventilation, protective clothing and respiratory protection is needed (combined organic vapor...
filtres+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 containes still have some material left, do not mix with other product with no knowledge of potential 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 oral 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 to conduct tests “on-site” in order 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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