

POLYUREA SPP



Pure polyurea elastomer for internal lining of GRP pipes

DESCRIPTION

Polyurea SPP is a 2 component polyurea elastomer for the internal lining of GRP pipes, where a very high resistance to impact and abrasion is required. This product can only be applied by 2-component spraying equipment.

APPLICATION

- Industrial machinery and vehicle protection.

PROPERTIES

- High adhesion and compatibility with most substrates (concrete, metal, GRP...).
- High resistance to abrasion / erosion and impact.
- Fast curing allows for in-line processing without blisters.
- Available in different RAL colours.

TECHNICAL DATA

INFORMATION ON THE PRODUCT BEFORE APPLICATION

	Component A	Component B												
Chemical description	Polyamine	Aromatic isocyanate prepolymer												
Physical state	Liquid	Liquid												
Packaging	Metal container 196 kg 18.6 kg Component C (pigment paste) Metal can (4 kg or 0.4 kg)	Metal container 220 kg 21 kg												
Non-volatile content	approx 100%	100%												
Lead content	< 1 mg/kg													
Flash point	>100°C	>100°C												
Colour	Dark yellow	Slightly yellow												
Density	<table border="1"><thead><tr><th>Temperature (°C)</th><th>Density (g/cm³)</th></tr></thead><tbody><tr><td>20</td><td>1.01</td></tr><tr><td>60</td><td>0.98</td></tr></tbody></table>	Temperature (°C)	Density (g/cm ³)	20	1.01	60	0.98	<table border="1"><thead><tr><th>Temperature (°C)</th><th>Density (g/cm³)</th></tr></thead><tbody><tr><td>20</td><td>1.14</td></tr><tr><td>60</td><td>1.10</td></tr></tbody></table>	Temperature (°C)	Density (g/cm ³)	20	1.14	60	1.10
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Mixing ratio A/B	A=1, B=1,13 by weight A=1, B=1 by volume													
Mixture properties	Fast polymerization. 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 SPP.													
Pot life	Gel time mixture A+B (20 g) 4 s at 25°C 3 s at 60°C													
Storage	Keep between 10° y 30°C.													
Use before	12 months after manufacture date, provided it is kept in its sealed container.													

INFORMATION ON THE FINAL PRODUCT

Final state	Solid elastomeric 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)	55D (ISO 868)

Mechanical properties	Elongation at break: 500% Tensile strength: 26 MPa (UNE EN ISO 527-1/3) Compression modulus: 130 MPa The membrane does not fail to compression under the test conditions (EN-ISO-604).				
Tear strength	110 N/mm (ISO 34-1) 400 N (EN-ISO-12310-2)				
Water vapour resistance factor	$\mu = 2.957$ (EN-ISO 7783:2012)				
Liquid water permeability	$W = 0,0008 \text{ kg/m}^2 \times \text{h}^{0.5}$ (EN-1062-3:2018)				
Gas Radon diffusion coefficient	$8 \times 10^{-12} \text{ m}^2/\text{s}$ (ISO/DTS 11665-13)				
Methane permeation coefficient	$140 \text{ Ncm}^3 \times \text{mm} / \text{m}^2 \times \text{day} \times \text{bar}$ (DIN 53380/ISO 15105-1)				
Carbon dioxide permeability	$\mu = 50484$. $S_d > 50$ (if coating thickness larger than 1 mm.) (EN ISO 7783:2012)				
Adhesion strength	<table border="1"><thead><tr><th>Surface</th><th>Adhesion (MPa)</th></tr></thead><tbody><tr><td>Concrete</td><td>2.5</td></tr></tbody></table>	Surface	Adhesion (MPa)	Concrete	2.5
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Concrete	2.5				
UV resistance	Good resistance to UV-induced degradation. Aromatic polyureas undergo change of colour under sunlight. This change does not affect its mechanical properties. Additional UV protection can be achieved by application of an Impertrans or Colodur pigmented topcoats. In that case, please ask before the Technical Assistance Supports of Krypton Chemical, S.L. Due to the high cross-linking of the polymer chains in Polyurea SPP, the adhesion of the aliphatic topcoats over this reference, once cured, is lower compared to that obtained over other pure polyureas with lower surface hardness.				
Abrasion resistance	Taber, CS10, 1000 c, 1 kg: 20 mg				
Electric strength	29,3 KV/mm (IEC EN-60243-1:2013)				
Surface resistivity	$1,30 \times 10^{14} \Omega/\text{cm}^2$ (ASTM D257-14)				
Volume resistivity	$1,30 \times 10^{14} \Omega \times \text{cm}$ (ASTM D257-14)				
Foldability at low temperature (-45°C)	Does not break or crack (EN-495-5)				
Glass transition temperature	-57°C (EN-6041)				
Impact resistance	24,5 N x m, Class III > 20 N x m (EN ISO 6272-1)				
Watertightness (5 bars, 50 meters of water column)	Watertight (EN-12390-8)				
Watertightness (100 kPa, 10 meters of water column)	Watertight (EN-1928)				
Crack bridging properties (static)	Class A5, -10°C (EN-1062-7, Method A)				
Crack bridging properties (dynamic)	Class B4.2, -20°C (EN-1062-7, Method B)				



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02/08/2024

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Onset decomposition temperature (TGA test)	287,7°C
Vicat softening temperature	130°C (EN-ISO-306)
Thermal conductivity (λ)	0,1847 W/m x K (22°C, EN 22007-2)
Heavy metal content (mg/kg)	Antimony (Sb): <1 Arsenic (As): <1 Lead (Pb): <1 Cadmium (Cd): <0.1 Chromium (Cr): <1 Nickel (Ni): <1 Mercury (Hg): <0.1 Selenium (Se): <1 Cobalt (Co): <1
Reaction to fire	Class E (EN 13501-1)

CHEMICAL RESISTANCE

Immersion test; (0=worst, 5=best)

Chemical	Conditions	Result
Water	15d, 80°C	5
Salt water (saturation)	15d, 80°C	5
Xylene	7d, 80°C	2
Ethyl acetate	7d, 80°C	1
Isopropyl alcohol	7d, 80°C	0
Sodium hydroxide 50%	7d, 80°C	5
Hydrogen peroxide 33%	7d, 25°C	4
Sulphuric acid 10%	7d, 80°C	5
Sulphuric acid 30%	30d, 80°C	4
Bleach	7d, 80°C	4
Ammonia	7d, 80°C	5
Diesel	16d, 80°C	5
Hydrochloric acid 12M 37%	7d, 80°C	0
Hydrochloric acid 6M 18%	7d, 80°C	1
Hydrochloric acid 3M 9%	7d, 80°C	4
Hydrochloric acid 0.75M 2%	7d, 80°C	5
Sodium hypochlorite 15%	7d, 80°C	4
Engine oil	7d, 80°C	5
Crude petroleum	21d, 20°C	5
Sulfamic acid 85%	7d, 60°C	4
Oleic acid	7d, 80°C	0
Glycerine	7d, 80°C	5
Kerosene	7d, 80°C	3

SUPPORT REQUIREMENTS

Original paint must be removed, and the surface must be clean and rust-free.

Metal should be resistant to deformation by curing stress.

Support temperature must be between 10°C and 40°C.

At higher temperatures, additional measures to be advised by the manufacturer must be taken.

Support moisture must be less than 4%.

SUPPORT PREPARATION

Metal substrates must be thoroughly sanded, and the final surface must be free of dust. A suitable adhesion-promoting primer must be used (e.g PU Primer) to prevent deformation, cracks or adhesion failure.

MIXING

Stir and homogenise 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 GUIDELINES

Polyurea SPP must be applied using a 2-component hot spraying equipment.

Recommended temperatures are:

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

Pressure should be 130 bar.

During application, check layer thickness and curing speed.

Spray Polyurea SPP at 1-2 kg/m².

Wind speeds more than 25 km/h may result in excessive loss of exotherm and interfere with the mixing efficiency of the spray gun affecting polyurea surface texture, cure, and physical properties and will cause overspray issues.

Contact Krypton Chemical for more detailed technical information.

CURING TIME

Approximate hardness values are provided as reference only (2 mm, polypropylene support, 20°C 50% RH)

Time	Hardness (Shore D)
5 min	35
45 min	43
6 hours	48
24 hours	50

REAPPLICATION

Usually, necessary thickness can be obtained in one single coat. If necessary, a second coat can be applied immediately afterwards. In any case, do not wait more than 2 hours for a second coat.

If spraying over a previously applied epoxy primer, ensure the primer is completely cured (ca 8 hours)

RETURN TO SERVICE

Under most usual conditions (25°C, 50% rh), the membrane is resistant to rain droplets after 5 minutes, and able to resist light pedestrian traffic in 1 hour.

After 1 day, more than 90% of the final properties are reached.

TOOL CLEANING

Solvent use for machine component cleaning is discouraged. A cleaning plasticizer fluid like Rayston Fluid is suitable. Component B must be completely removed from all air-exposed parts and replaced with this cleaning fluid. A maintenance work should be carried out regularly on the treated surfaces according to the intended use.

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FAQs

Problem	Question	Cause	Solution
Product does not cure	A/B ratio is correct?	Pressure differences	Check and correct machine operation
Bubbles or open pores	Porous support?	No primer	Apply suitable primer before Polyurea SPP
No hiding power	Horizontal?	Too little product Too little pigment	Apply 1 kg/m ² Ensure full A+pigment homogeneization
Colour change	Exposed to sunlight?	UV-reaction	Use a last coat in dark grey or red
	Can it be applied without pigmentation?		Polyurea SPP is always delivered with the pigment of choice. Use of pigment helps to obtain a uniform appearance.

SAFETY

Component B contains isocyanates. Always follow the safety instructions in the Material Safety Data Sheet. As a rule, a good ventilation and/or respiratory protection is needed (combined organic vapor filters+particles) along with protective clothing. 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

LEED-requirements compliant. EQ Credit 4.2, Low emission materials: Paints and Coatings. 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 contains 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 to get an inert material, but never do it in volumes larger than 5 litres to prevent a dangerous heat evolution.

RECYCLABILITY

The coating, once cured, is inert, free of hazardous materials and heavy metals, so it is fully recyclable at the end of its useful life, for example, as a filler for lightened concrete or mortars.

OTHER INFORMATION

The information contained in this Technical 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 to conduct 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 Technical Data Sheet supersedes previous versions.