IMPERMAX POLYUREA H

Hot spray-applied polyurea waterproofing membrane

DESCRIPTION

Impermax Polyurea H is a polyurea resin, applied with a hot spray machine, totally free of solvents and mineral fillers. Once cured, it forms a totally continuous waterproofing membrane, (without joints or overlaps), of high mechanical and external resistance, thermoset and elastomeric (with the ability to bridge the possible fissures of the support). The membrane heals in a few seconds and its commissioning is in a few hours.

APPLICATION

- Waterproofing of roofs, terraces, and balconies on different types of supports (concrete, metal, old asphalt fabrics, prefabricated membranes), always using a suitable primer.
- Waterproofing and protection of concrete structures, especially those exposed to the outside.
- Protective finish of polyurethane insulating foam.
- Waterproofing of foundations and buried structures.

PROPERTIES

- Fully continuous, thermoset, flexible and elastic membrane, with an excellent ability to bridge possible fissures of the support.
- Extremely fast curing and commissioning.
- Possibility of high solar reflectance finishes type "cool roof" with the Colodur Pigmented in white.
- It can be exposed to the outside or covered by tiles, concrete or other material. Being a membrane of aromatic nature, if it is exposed to sunlight it is recommended to protect it with an aliphatic protective finish (Colodur Pigmented or Impertrans Eco) to maintain its aesthetic appearance over time.
- Resists continuous contact with stagnant (neutral) water on decks.

CERTIFICATIONS

- ETA: European Technical Assessment nº 11/062 (W2, 10 years without topcoat and W3, 25 years with protective topcoat, Impertrans Pigmented), certificate of resistance to root penetration is included, based on EN-13948.
- Reaction to fire class: Cfl-s1, based on EN-13501-1.
- Hail resistance (EN-13583).
- Environmental Product Declaration, registration number EPD-IES-0020897.

TECHNICAL DATA

INFORMATION ON THE PRODUCT BEFORE APPLICATION		
	Component A	**Component B**
Chemical description	Polyol/Polyamine	Aromatic isocyanate prepolymer
Physical state	Liquid	Liquid
Packaging	Metal container 196 kg 18.6 kg Component C (pigment paste) Metal can (0.4 kg or 4 kg)	Metal container 220 kg 21 kg
Non-volatile content	100%	100%
Flash point	>100ºC	>100ºC
Colour	Yellow	Slightly yellow
Density	Temperature (ºC) / Density (g/cm³) 25 / 1.05	Temperature (ºC) / Density (g/cm³) 25 / 1.12
Viscosity	Temperature (ºC) / Viscosity (mPa.s) 25 / 750	Temperature (ºC) / Viscosity (mPa.s) 25 / 800
VOC (2004/42/CE)	<2g/L, <0,2% A, j	0 A, j
A/B mixing ratio	A=1, B=1,05 by weight A=1, B=1 by volume	
Density and viscosity of the mixture	Fast polymerization. See Pot life data.	
Colour	Yellow - brown. Component A is pigmented by addition of pigment paste (Pigment Spray) for Impermax Polyurea H.	
Pot life	Gel time mixture A+B (20 g) 8-9 s at 25ºC 4-6 s at 60ºC	
Storage	Keep between 10º y 30ºC. Products are hygroscopic: protect from moisture. Component B may become hazy upon storage at low temperatures. Reheat mildly before use. Use 12 months before manufacture date	

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)	90A/40D (ISO 868)
Tear strength	69 N/m (ISO 34-1, method B)
Mechanical properties	Elongation at break: 400% Tensile strength: 15 MPa (EN-ISO 527-3)
UV resistance	Good resistance to UV-induced degradation. Aromatic polyureas undergo change of colour under sunlight. Additional UV protection can be achieved by application of a Impertrans Pigmented or Colodur Pigmented topcoat.
Abrasion resistance	Taber, CS17, 1000 c, 1kg: 25mg
Electric strength	17,6 KV/mm (IEC EN-60243-1:2013)
Foldability at low temperature (-45ºC)	Does not break or crack (EN-495-5)

KRYPTON CHEMICAL SL
C/ Martí i Franquès, 12 - Pol. Ind. les Tàpies
43890 - l'Hospitalet de l'Infant - Spain
Tel: +34 977 822 245 - Fax: +34 977 823 977
www.kryptonchemical.com – rayston@kryptonchemical.com

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Adhesion strength	**Substrate**	**Adhesion strength (MPa)**
	Concrete (EP 100 primer)	5.6
	Steel (PU primer)	3.6
External fire behaviour	$B_{roof}(t1)$ and $B_{roof}(t2)$ (EN-13501-5) $B_{roof}(t2)$ over combustible and non-combustible support.	
Reaction to fire	C_{fl}-s1 (EN-1305-1)	
Water vapour permeability	μ =2000. 14 grams/m^2 x day (EN 1931)	
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	
Chemical resistance	Immersion test. Continuous contact. (0=worse, 5=better)	
	Chemical	**Conditions** / **Result**
	Water	15d, 80ºC / 5
	Brine	5d, 80ºC / 5
	Diesel	16d, 80ºC / 5
	Xylene	7d, 80ºC / 1
	Ethyl acetate	7d, 80ºC / 0
	Isopropyl alcohol	7d, 80ºC / 0
	Sodium hydroxide (40g/L)	7d, 80ºC / 5
	Hydrogen peroxide (33%)	7d, 25ºC / 4
	Ammonia (3%)	7d, 80ºC / 5
	Sulfuric acid (10%)	7d, 80ºC / 4
	Hydrochloric acid conc.	7d, 80ºC / 0
	Bleach	7d, 80ºC / 4
	Sulfamic acid (8.5%)	7d, 60ºC / 4
Vicat softening temperature	103ºC (EN-ISO-306)	
Thermal conductivity (λ)	0,1897 W/m x K (22ºC, EN 22007-2)	
Crack bridging properties	Static : Class A5, -10ºC (EN-1062-7, Method A) Dynamic : Class B4.2, 23ºC (EN1062-7, Method B)	

SUPPORT REQUIREMENTS

To achieve good penetration and bonding, support must be:

1.Flat and levelled.

2. Compact and cohesive (pull off test must show a minimum resistance of 1,5 N/mm^2).

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.

RECOMMENDED ENVIRONMENTAL CONDITIONS

The air temperature should be between 10ºc and 40ºC. Relative air humidity should be less than 85%.

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.

MIXING

Stir and homogenise component A using suitable mixing equipment before being loaded into the machine. Add the required pigment to the A-component and keep mixing before loading at low speed for a few minutes. Excess stirring may lead to undesirable moisture pick up. Recirculate both components while heating up to the required application temperatures.

APPLICATION GUIDELINES

Impermax Polyurea H must be applied using a 2-component hot spraying equipment. The use of a compressed air dryer (refrigeration dryer) or compressed air-drying filters is recommended.

Recommended temperatures are:

- Component A: 60ºC
- Component B: 70ºC
- Hose: 65ºC

Pressure should be at least between 135 and 170 bar while spraying.

During application, check layer thickness and curing speed.

Spray Impermax Polyurea H at 2 kg/m^2 as a rule.

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

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

Time	Hardness (Shore A/D)
10 min	74/27
20 min	77/29
1 hr	80/30
24 hr	88/35

RE-APPLICATION

Usually, needed thickness can be obtains in one single coat. If necessary, a second coat can be applied immediately afterwards.

RETURN TO SERVICE

Under most usual conditions (25ºC, 50% rh), the membrane is resistant to rain droplets after 15 minutes, and able to resist light pedestrian traffic in 1 hour. After 2 days, 90% of the final properties are reached.

TOOL CLEANING

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

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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 to prevent gutter obstructions.
- Check the proper condition of several structures (flashing, seams, retaining walls...)
- Verification of possible damages due to improper use.

If the 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 must be cut and repaired with a new Impermax Polyurea H or Impermax application.

FAQ

Problem	Question	Cause	Solution
Product does not cure	AB ratio is correct?	Pressure differences	Check and correct machine operation
Bubbles or open pores	Porous support?	No primer	Apply suitable primer before Impermax Polyurea H
No hiding power	Horizontal?	Too little product	Apply 1 kg/m^2
		Too little pigment	Ensure full A+pigment homogenisation
Colour change	Exposed to sunlight?	UV-reaction	Use a last coat in dark grey or red
	Can it be applied without pigmentation?		Not recommended. Impermax Polyurea H 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

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 to get an inert material, but never do it in volumes larger than 5 liters 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 DATA SHEET, as well as our advice, both written as verbal or provided through testing, is 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 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.