IMPERMAX POLYUREA H FLEX

Sprayed, hot-applied polyurea waterproofing membrane

DESCRIPTION

Impermax Polyurea H Flex is a 2-component polyurea resin, which cures very fast into an elastic membrane with crack-bridging capacity. This product can only be applied by 2-component spraying equipment. Impermax Polyurea H Flex can be combined with different geotextiles to obtain on-site applied, seamless liners (Rayston Spray liners). It can be also pigmented with aluminium particles pigments to obtain sun-reflective properties.

APPLICATION

Waterproofing of concrete structures and bridge decks. Impermax Polyurea H Flex can be completed with an additional UV-resistant coating. Roof waterproofing. Geomembrane lining for retention basins and secondary containment structures, ponds, landfills, tunnels, canals, dam reparations, etc.

CERTIFICATIONS

- **ETA**: European Technical Assessment Nº 21/0740 (EAD 030675-00-0107). Waterproofing of bridge decks. **CE marking.**
- **ATG** (Belgium) nº3247. Waterproofing of bridge decks.
- Bridging capacity of support cracks after thermal impact of mastic asphalt (250ºC, EN-14224). Before and after accelerated thermal ageing, TR011.
- Reaction to fire. Class B2 (DIN 4102-1:1998).
- External fire behaviour (over combustible support and over old PVC membrane. $B_{roof}(t2)$.
- Hail resistance (EN-13583).
- Resistance to root penetration according to CEN/TS 14416:2014.

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 203 kg and 18.8 kg	Metal container 213 kg and 20.8 kg
Non-volatile content	Approx 100%	100%
Lead content	(< 1 mg/kg)	
Flash point	>100ºC	>100ºC
Colour	Dark yellow	Slightly yellow
Density	1.05 g/cm^3 20ºC 1.02 g/cm^3 60ºC	1.14 g/cm^3 20ºC 1.10 g/cm^3 60ºC
Viscosity	975 mPa.s 20ºC 170 mPa.s 60ºC	800 mPa.s 20ºC 120 mPa.s 60ºC
VOC (2004/42/CE)	<2g/L, <0,2% A, j	0 A, j
A/B mixing ratio	A=1, B=1.08 by weight A=1, B=1 by volume	
Density and viscosity of the mixture	Fast polymerization. See Pot life data.	
Colour	Dark yellow, but component A is pigmented by addition of pigment paste (Pigment Spray) for Impermax Polyurea H Flex.	
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. Product is hygroscopic: protect from moisture. Component B may become hazy upon storage at low temperatures. Reheat mildly before use.	
Use before	12 months after manufacture, 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)	90A/40D (ISO 868)
Tear strength	43 N/mm (ISO 34-1)
Mechanical properties	Elongation at break: 400% Tensile strength: 15 MPa (EN-ISO 527-3) After thermic accelerated ageing (28 days at 70ºC, EOTA TR11): Variation tensile strength (+8%). Variation elongation at break (-1%)
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 or colodur topcoat.
Static indentations	Liners obtained by combination of Impermax Polyurea H Flex and selected geotextiles achieve a static indentation resistance above 3200 kN (UNE EN ISO 12236:2007)
Reaction to fire	Class B2 (DIN 4102-1:1998)
Water vapour resistance factor	μ = 5933 (EN-ISO 7783: 2012)
Liquid water permeability	W = 0,002 Kg/m^2 x h^{0,5} (EN-1062-3: 2018)
Watertightness (60kpa, 6 meters of water column)	Watertight (EN-1928)
Carbon dioxide permeability	μ = 99307. Sd > 50 (if coating thickness larger than 2 mm.) (EN 1062-6:2003)
Chloride ion ingress	≤ 0,01 %, at 10 mm. depth. (EN 13396:2005)
Abrasion resistance	Taber, CS17, 1000 c, 1kg: 22mg
Foldability at low temperature (-45ºC)	Does not break or crack (EN-495-5)
Onset decomposition temperature (TGA test)	290,5ºC
Impact strength	24,5 N x m, Class III > 20 N x m (EN ISO 6272-1)
Crack bridging properties (static)	Class A5, 23ºC & -10ºC (EN-1062-7, Method A)
Crack bridging properties (dynamic)	Class B4.2, -20ºC (EN-1062-7, Method A)
Chemical resistance	Permanent contact (7 days, 80ºC, 0=worst, 5=best)

Chemical	Result
Water	5
Ammonia (3%)	5
Hydrochloric acid 3M (9%)	4
Isopropyl alcohol	1
Xylene	0
Sulphuric acid (50%)	0
Urea	5
Ammonium nitrate	5

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Adhesion strength	Substrate	Adhesion strength (MPa)
	Concrete (EP 100)	5.6
	Steel (PU primer)	3.6
Surface electrical resistance	Dry membrane: 4.76 x 10^{11} Ω Wet membrane, after immersion in water: 2.09 x 10^{11} Ω (CEI-EN-62631-3-2)	

SUPPORT REQUIREMENTS

To achieve a 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

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 Flex 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: 70ºC
- 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 Flex 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 Flex 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 hour	80/30
24 hours	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.

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 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 must be cut and repaired with a new Impermax Polyurea H Flex 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 Flex
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

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Can it be applied without pigmentation?	Not recommended. Impermax Polyurea H Flex 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 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 litters 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 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 data sheet supersedes previous versions.