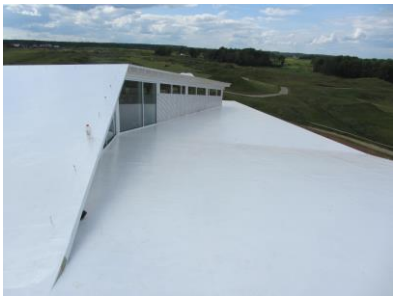
IMPERMAX 2K

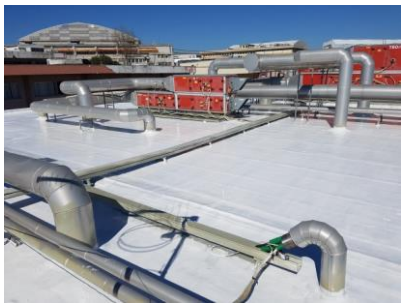
Bio-based polyurethane membrane for waterproofing of covers, applied with a hot projection machine

DESCRIPTION



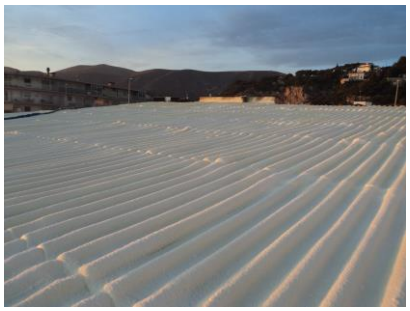
Impermax 2K is a two-component resin of sustainable polyurethane, formulated with renewable raw materials of vegetable origin (bio-based), applied with a hot projection machine, totally free of solvents and mineral fillers. Once cured, it forms a completely continuous waterproofing membrane (without joints or overlaps), of high mechanical and external resistance, thermoset and elastomer (with the ability to bridge the possible fissures of the support). The coating, once cured, is inert, free of hazardous materials and heavy metals, making it fully recyclable at the end of its useful life. The membrane heals in a few seconds and its commissioning is in a few hours.

APPLICATIONS



- Roof waterproofing, parking covers, terraces and balconies on different types of supports (concrete, metal, old asphalt fabrics, prefabricated membranes...), always using a proper primer. Specially designed for the waterproofing of vegetable roofs (extensive and intensive) and planters.
- Encapsulation of asbestos fibers in roofs or other structures.
- 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 (Pigmented Colodur, Pigmented Impertrans or Impertrans) to maintain its aesthetic appearance over time.
- Resists continuous contact with stagnant water (neutral) on decks.

CERTIFICATIONS

- ETE: European Technical Evaluation nº 10/0296 (W3, 25 years), includes polyurethane insulating foam support of densities 50 kg/m^3 and 150 kg/m^3.
- Certificate of resistance to root penetration according to: EN-13948 (included in the ETE).
- Applus Laboratory. Certificates of behavior to an outside fire and reaction to fire. Foldability at low temperature. Continuous contact with drinking water according to RD 140/2003 and 98/83 CE.
- Giordano Institute (Italy). 4 asbestos encapsulation certificates. Outer exposed membrane with Epoxy 100 primer and Rayston Spray Primer 150. Inner exposed membrane. Unexposed membrane. External fire behaviour, $B_{roof}(t2)$
- Beta Analytic Laboratory. % Carbon of biological origin (carbon-14 technique).
- Aitex Laboratory. Geomax Spray 200 system plus Impermax 2K. Tensile tests, static puncture and tearing.
- Eurofins Laboratory. Heavy metal content of the cured membrane.

TECHNICAL DATA

INFORMATION ON THE PRODUCT BEFORE APPLICATION

	Component A	Component B
Chemical description	Polyol/Polyamide	Aromatic isocyanate prepolymer
Physical state	Liquid	Liquid
Packaging Note: Pigment is delivered in a third container. See Pigment Spray data sheet for specific details.	Metal container 196 kg + 4kg pigment spray	Metal container 220 kg
Non-volatile content	Approx 100%	100%
Flash point	>100ºC	>100ºC
Colour	Dark yellow (may darken along storage)	Slightly yellow

Density	Temperature (ºC)	Density (g/cm^3)	Temperature (ºC)	Density (g/cm^3)
	25	1.02	25	1.12

Viscosity	Temperature (ºC)	Viscosity (mPa.s)	Temperature (ºC)	Viscosity (mPa.s)
	25	1200	25	2000

VOC (g/L and %) VOC class as per 2004/42/EC	<2g/L, <0,2 % A, j	0 A, j
A/B mixing ratio	A=1, B=1.12 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) delivered with each kit of Impermax 2k.	
Pot life	Gel time mixture A+B (20 g) 16 s at 25ºC	
Storage	Keep between 10º y 30ºC (recommended).	
Use before	12 months after manufacture, provided it is kept in its sealed container.	

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INFORMATION ON THE FINAL PRODUCT	
Final state	Solid elastomeric membrane
Colour	Available Pigment Spray pastes are light grey, dark grey, rust red. Other pastes available on request.
Hardness (Shore)	83A (ISO 868)
Mechanical properties	Elongation at break: 350% Tensile strength: 13 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 or colodur topcoat.
Tear strength	43 N/mm (ISO 34-1, method B)
Water vapour permeability	μ = 2000, 14 g/m² day (EN 1931)
Thermal resistance	Degradation begins at 180ºC
External fire behaviour	B_{roof} (t1) and B_{roof} (t2) (EN 13501-5)
Reaction to fire	Class E (EN 13501-5)
Foldability at low temperature	Pass at -30ºC (without fissures) (EN 495-5)
Heavy metal content (mg/kg)	Barium (Ba): <1 Manganese (Mn): <1 Selenium (Se): <1 Arsenic (As): <1 Lead (Pb): <1 Cadmium (Cd): <0,1 Chromium (Cr): <1 Mercury (Hg): <0,1 Cobalt (Co): <1

CHEMICAL RESISTANCE

Permanent contact (0=worst, 5=best)

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
Urea	24d, 80ºC	5
Ammonium nitrate	24d, 80ºC	5

ADHESION TO VARIOUS SUBSTRATES

Substrate	Adhesion (MPa)
Concrete (Primer Epoxy 100)	4,0
Wood chipboard (Primer Epoxy 100)	1,5 (Sustrate faillure)
Steel (PU Primer)	4,7

SUPPORT REQUIREMENTS (ADHERED SYSTEM)

To achieve optimal adhesion on a porous support (concrete, for example), it must have the following conditions:

1. Leveled.
2. Compact and cohesive (the pull-off test must show a minimum resistance of 1.5 N/mm^2).
3. Uniform and regular surface. Totally continuous.
4. Free of cokes, cracks, and fissures. If there are, they must be repaired beforehand (filled with a polyurethane putty, for example).
5. Clean and as dry as possible, free of dust, loose particles, surface grouts, mosses, oils, greases, and organic residues.
6. Fully cured.

Metal substrates should be clean and free of corrosion, oils, greases, or other loose materials.

RECOMMENDED ENVIRONMENTAL CONDITIONS

Air temperature should be between 10ºc and 40ºC. The relative humidity of the air should be less than 85%. Higher relative humidity can prevent proper polymerization, in addition to the adhesion is not good due to the presence of liquid water (condensations) on the support.

The temperature of the stand must be 3 degrees above the dew point to avoid the risk of condensation.

It is recommended not to apply in the presence of wind due to the risk of overconsumption and fouling of adjacent surfaces, especially with wind speeds or gusts greater than 25 km / h.

SUPPORT PREPARATION

Concrete supports can be prepared mechanically with sandblasting or sanding with a diamond machine, for example. With the aim of eliminating small irregularities of the surface and opening pore.

Dust and loose particles can be removed with a brush or better, with a vacuum cleaner.

The primer should be applied in a sufficient amount to completely seal the porosity of the substrate. Once cured it should have a shiny appearance, if it has a matte or satin appearance it means that the support has completely absorbed the resin, the porosity of the support is not well sealed, and an additional layer of primer is required.

On a dry porous surface (humidity less than 4%), it's recommended Epoxy Primer 100.

Epoxy 100 Primer can be applied in a single, high-thickness layer or in two layers if better system adhesion is required. The first layer is applied diluted with Rayston Solvent (5-10%), the second layer is applied without dilution and with fresh quartz sand sprinkling.

On a wet porous surface, humidity greater than 4%, (without waterlogging) it is recommended to apply the Primer GC.

Tecnocem can be used to regularize supports, especially if inside there is a significant degree of humidity. Over Tecnocem, H Primer will be applied before the Impermax 2K.

Metal supports must be cleaned, degreased, and treated with a non-filmogenic adhesion promoter type PU Primer and subsequently with an anticorrosive primer, TP Flex Primer, or Polyurea Flex Primer.

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MIXING

It is recommended that the drum of component A and the drum of component B are preconditioned between 25ºC-30°C before loading (heating belts can be used, for example). Shake and homogenize component A using appropriate equipment. Add the (pre-dosed) amount of Pigment Spray in component A and keep mixing. Recirculate both components while heating to the prescribed application temperature.

APPLICATION GUIDELINES

Impermax 2K 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

Request specific information for cold weather applications.

Pressure should be at least 140 bar while spraying.

During application, check layer thickness and curing speed.

Spray Impermax 2k at 1,8-2,0 kg/m^2 to achieve a minimum 1,9 mm thickness.

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 further information.

CURING TIME

Approximate hardness values are provided as reference only (1 mm, polypropylene support, 25ºC 50% RH)

Time	Hardness (shore)
15 min	30
30 min	47
1 hr	60
3 hr	72
8 hr	79
24 hr	82
7 days	87

RE-APPLICATION

Usually, needed thickness can be obtains 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 cures (ca 8 hours).

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 like Rayston Fluid is suitable. Component B must be completely removed from all air-exposed parts and replaced with this cleaning 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, 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 2k 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 2k
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 2k 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 in order 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 load 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, 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.