



TECNOCOAT P-2049 - PURE POLYUREA MEMBRANE FOR WATERPROOFING AND COATING

Two component, fast setting, hot spray pure polyurea membrane for waterproofing, protection and sealing. It is made up of two highly reactive liquid components, Tecnocoat P-2049/A (isocyanates) and Tecnocoat P-2049/B (amines), mixed together using our specific proportioner TC2049 or similar, to form a solid, durable and aromatic pure polyurea membrane, completely adhered to the substrate, without joints or overlaps, flexible, watertight and waterproof, **with high mechanical properties and shore hardness.**



USES

For application in the following situations:

- Sloped/flat walkable roofs, IRMA, balconies, and overhangs. (ETA 11/0357, BBA 16/5340, DTA 19.2665)
- Green roofs (P4:TH4, ETA 11/0357, BBA 16/5340, DTA 19.2665)
- Bridge-deck waterproofing under asphalt on concrete elements of civil engineering (ETA 21/0942, BBA 24/7158)
- Tanks and irrigation canals, potable water contact (BS-6920 and WRAS approval)
- Parking garages, with heavy traffic (OS10)
- Industrial floor surfaces with hard-wearing requirements (EN 1504-2)
- Concrete decks, retaining walls, and foundations (EN-1504.2)
- Power plants, recycling, water-waste plants, water treatment, and petrochemical plants (EN-1504.2)
- Swimming pools, aquariums, lakes. Sea water environments
- Work truck and truck bed linings, furniture and thematizations
- Military protection
- Flat or sloped asbestos roofs (on TECNOFOAM, spray polyurethane foam system)
- As a protection for SPF (TECNOFOAM, spray polyurethane foam system)

NOTE: call our technical department about the application to other substrates or scopes of use

Minimum thickness	1.5 mm
Tack-free time	±5 secs
Tensile strength	>20 MPa
Elongation at break	>350 %
Hardness Shore A/D	>93/>50
Application method	Spray equipment



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COLORS

	White
	Gray
	Black
	Red

* The 60 kg kit format is only available in gray

GENERAL SPECIFICATIONS

- Two component, fast setting, 100% solids content, aromatic pure polyurea that once applied, forms a hard-wearing, continuous, flexible, seamless, waterproofing, and solid membrane that offers a certified waterproofing, watertight behavior.
- It holds an ETA 11/0357, issued by EOTA (European Organization for Technical Assessment). under the EAD 030350-00-0402 guide, specific approval for "Liquid Applied Roof Waterproofing Kit, based on pure polyurea" working life 25 years (W3), at 1.4 mm thickness, ponding water admitted
- It holds a BBA certification n 16/5340 (validation on UK market and influenced) for waterproofing of walkable roofs, at 1.4 mm thickness, ponding water admitted
- It holds the French Certificate DTA 5.2-19-2665 (Avis Technique) issued by CSTB for deck roofing, at 1.4 mm thickness, ponding water admitted
- It holds an ETA 21/0942 specific approval for "Liquid Applied Bridge Deck Waterproofing based on pure polyurea", to use as a protection for the concrete on bridge-deck and to be covered by asphalt, issued by EOTA (European Organization for Technical Assessment) (see the specific Technical Guideline), at 2,3 mm thickness.
- It holds a BBA certification n 24/7158 (validation on UK market and influenced) for "Bridge Deck Waterproofing based on pure polyurea", at 2.3 mm thickness, ponding water admitted
- Green roof application certified, root resistance, according to the EN 13948 (ETA 11/0357 and BBA 16/5340)
- Suitable for drinking water for human consumption, issued by NFS Wales Ltd., under the BS-6920 "Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water" and WRAS approval.
- It has CE marking on the basis of a statement made DoP Declaration of Performance (DoP) conforms to the UE 305/2011 regulation.
- It holds the certification for the Radon gas diffusion according to the ISO/DTS 11665-13.
- It holds the certification for the Ozone gas resistance according to the S/N ISO-1431-1.
- The application and training are done by our spray equipment TC2049 (spray-equipment.tecnopolgroup.com) or similar
- Thanks to its versatility and its tack-free time of around 3-5 seconds, allows the adhesion to any contour, making it the ideal product for application on uneven surfaces and in areas of any shape, whether curved or squared.
- Due to its resistance, it can be walked in minutes and it will accept a rough finish to make it slip resistant. (using Silica Sand or Tecnoplastic range aggregates)
- A ceramic floor can be placed on top. In this case, we recommend applying a thin coat of Primer PU-1030, Primer PU-1000 or Primer PU-1050, consumption of around 50 to 60 g/sqm, and spreading Silica Sand on top, consumption of around 700-1000 g /sqm, to improve mechanical anchorage.
- Joints and any type of union are saved since the finish is uniform and in one piece, providing a surface with optimal maintenance and cleaning.



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- Has properties to allow it to adhere to most surfaces such as concrete, ceramic tiles, metals, spray polyurethane foam (Tecnofoam), plywood(OSB), asphalt/bituminous sheets. In any case or material, the surface must be consistent and sound (*concrete pull-off strength >1.5 MPa*), clean, and dry when the products are applied. Recommended applying directly on the concrete deck.
- Free from harmful VOC compounds, therefore, it does not hurt the ozone layer (VOC's zero). It's 100% recyclable by mechanical means friendly to the environment; no gas collection for recycling and/or destruction is required; it doesn't emit substance to the environment once installed..
- It should be applied in dry conditions avoiding the presence of humidity or coming from the surface to be coated or the substrate, whether at the time of application or subsequently (pressure from phreatic water level). In the event there is humidity in the substrate at the time of application.
- It is an aromatic membrane and, even though it is stable against solar radiation it requires solar radiation protection (UV rays) to do not lose its physical and mechanical properties. Therefore, our approved system (under ETA 10/0121, BBA 16/5340 and DTA 5.2-19/2665), incorporates a protective polyurethane colored aliphatic resin, Tecnotop 2C, for use in the absence of other physical protection elements. You can apply Tecnotop S-3000, Tecnotop 2CP or Tecnotop 1C also.
- The membrane may be in contact with chemical elements. Consult to the our technical department the table of chemical resistance, to know the type of exposure, temperatures and type of chemical element.

YIELD

The recommended minimum thickness is 1.5 mm. (60 mils DFT), total yiedl is 1.7 kg/sqm, applied in various coats. The total thickness may vary according to substrate or climatological conditions.

PACKAGING

Metallic drum kit, in two different formats:

- LARGE KIT: 225 kg each component (B side: amines and A side: isocyanates).
- SMALL KIT: 60 kg each component (B side: amines and A side: isocyanates).

STORAGE AND SHELF LIFE

12-months shelf life is stored in original containers in a dry environment at a temperature between 5-35 °C (41-95°F). Keep away from direct sunlight, extreme heat, cold or moisture. Prior to application, B side must be thoroughly mixed with a drum mixer before inserting the transfer pumps and use. This step is very important, please consult your representative for recommendations.

APPLICATION METHOD

Cement or concrete substrates: Concrete should be completely cured (concrete curing takes 28 days) or, in any case, the maximum level of humidity allowed for the substrate should be verified, depending on the primer used. Concrete must be strong, cohesive and dry, having a correct planimetry, high surface resistance, eliminating laitance, graise, oils or release agents, without excessive irregularities. Therefore, the previous action of sanding, polishing, milling or shot-blasting will be assessed by the applicator to achieve a preparation of the substrate according to ICRI Guide 03732, CSP values 3 to 5. Existing holes or areas with a lack of material must be repaired using some of our epoxy resins: Primer EP-1020/Primer EP-1010. Mastic PU must be used on fissures or small cracks on the surface. In joints (width < 15 mm): remove old material, clean and fill with Mastic PU. In joints (width >15 mm): remove old material, clean and fill with Mastic PU. Complement with a Tecnoband 100 band on the upper part. In structural/expansion joints: remove old material, clean and fill with Mastic PU. Complement with specific elastic bands and Tecnoband 100. General cleaning of the substrate. PRIMING: use Primer PU-1050/Primer PUC-1050, Primer EP-1020, Primer EP-1010 or Primer WET, depending on the existing moisture in the substrate. Apply/spray the membrane. Aliphatic polyurethane as an aliphatic topcoat: Tecnotop 1C/2C/2CP.

Ceramic tiles substrate: Ceramic surfaces should not have empty joints or loose elements or parts. These should be



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filled with Mastic P-2049 mastic or mortar, according to their size. Existing joints or seals: remove the old material, clean up and fill with Mastic P-2049. Sanding with specific equipment. Thereby, to remove moss or solids particles bonded to the substrate, and opening the pore. Clean up, using a vacuum method. PRIMING: use Primer EP-1040, Primer EP-1010 or Primer EPw-1070, depending on the existing moisture in the substrate. Apply/spray the membrane. Aliphatic polyurethane as an aliphatic topcoat: Tecnotop 1C/2C/2CP.

NOTE: For other types of substrates, weather conditions or the substrate to be applied, consult our technical department.

REPAIR AND OVERLAPS PROCESSES

REPAIR: In cases where the membrane repair by accidental causes, or assembly procedures not covered installations, shall be as follows: Cut, removal of the affected area and/or damaged surface. Sanding this area extending about 20~30 cm. around the perimeter, for overlapping security. Cleaning (vacuuming) of waste generated (powder, dust...); if it's possible don't use water, and if used, support humidity value; ketones applicability based solvents for reducing this type of surface cleaning. Apply a thin layer (100-150 g/sqm) of polyurethane resin Primer PU-1030, Primer PU-1050, Primer PU-1000. Light spread Silica Sand over the wet primer applied before. Wait for the total drying. Apply/spray the membrane evenly and in several layers until the dry film thickness required by the project is achieved. Application of the aliphatic polyurethane resin for protection against UV rays Tecnotop 2C/2CP/1C

OVERLAPS: In cases has been exceeded recoat time (24~48 hours), so the waiting time between jobs is prolonged, proceed as follows: Sanding strip longitudinal overlap of about 20~30 cm. wide. Cleaning (vacuuming) of waste generated (powder, dust...) or existing dust; if it's possible, do not use water, and if it's used, check the support humidity value; ketones applicability based solvents for conducting this type of surface cleaning. Apply a thin layer (100-150 g/sqm) of polyurethane resin Primer PU-1030, Primer PU-1050, Primer PU-1000. Light spread Silica Sand over the wet primer applied before. Wait for the total drying. Apply/spray the membrane evenly and in several layers until the dry film thickness required by the project is achieved. Application of the aliphatic polyurethane resin for protection against UV rays Tecnotop 2C/2CP/1C

APPLICATION REQUIREMENTS (PROPORTIONER)

It is necessary to mix the two initial liquid components using a high-pressure plural component proportioner; isocyanates and amines must be mixed 1:1 in volume using our spray equipment TC2049 (spray-equipment.tecnopolgroup.com) or similar (proper maintenance and cleaning it is recommended). The general parameters for material area as follows:

- Isocyanate heater temperature: 70-75 °C (158°F to 167°F)
- Amine heater temperature: 70-75°C (158°F to 167°F)
- Hose temperature: ±70 °C (158°F)
- Working pressure: 2.500 - 3.000 psi (170 to 205 bar)
- Recommended mixing chamber: GU-07008-1 or GU-07008-2

These temperatures and pressure parameters must be valued, ratified or slightly varied by the applicator, depending on the conditions of each climatic zone, weather situation or according to the specifications of the projection equipment. It is the responsibility of the owner / applicator of the equipment to keep it in perfect condition in order to maintain the correct mixing ratio of the two components that Tecnopol delivers separately, by periodically updating its maintenance controls. During the execution of the application, it may be necessary to correct these parameters according to changing external conditions, as well as to verify the correct operation of the machine (pressure and temperature). The part B must be thoroughly mixed with an mechanical mixer before inserting transfer pumps. Isocyanate are sensitive to moisture, ensure the drums and spray equipment are protected from moisture during storage and application. Store and clean proportioner by manufacturer's suggested guidelines.

HEALTH AND SAFETY

Respiratory Protection: When handling or spraying use an air-purifying respirator. Skin protection: Use rubber gloves, remove immediately after contamination. Wear clean body-covering. Wash thoroughly with soap and water after work



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and before eating, drinking, or smoking. Eye / Face: Wear safety goggles to prevent splashing and exposure to particles in the air. Waste: Waste generation should be avoided or minimized. Incinerate under controlled conditions in accordance with local laws and national regulations. Re-occupancy of the work site without respiratory equipment is minimum 24 hours providing the correct ventilation for the area sprayed. Contractors and applicators must comply with all applicable and appropriate guidelines for storage and safety guidelines. These safety recommendations for handling, are necessary for the implementation process as well as in the pre and post, on exposure to the loading machinery. Dispose waste in accordance with star or/and local regulations.

TECHNICAL AND CHEMICAL PROPERTIES OF THE MEMBRANE

PROPERTIES	RESULTS
Density ISO 1675	$\pm 1.10 \pm 0.05 \text{ g/cm}^3$
Density compounds* A/B ISO 1675	$1.11 \pm 0.05 \text{ g/cm}^3 - 1.10 \pm 0.05 \text{ g/cm}^3$
Viscosity compounds* A/B (at 12 rpm) ISO 2555	$850 \pm 50 \text{ cps} - 1,100 \pm 250 \text{ cps}$
Mixing ratio (weight - volume)	1:1
Tack-free time / recoat time	$\pm 5 \text{ seconds} / 10 \text{ secs} \sim 48 \text{ hours}$
Use temperature range (environment)	$-20 \sim 90 \text{ }^\circ\text{C} \quad (-4 \text{ to } 194^\circ\text{F})$
Application temperature range (substrate and environment)	$3 \sim 35 \text{ }^\circ\text{C} \quad (41 \text{ to } 95^\circ\text{F})$
Maximum environmental humidity	$\pm 85\%$
Maximum liquid temperature in continuous contact	$50 \sim 55^\circ\text{C}$
Ready to use: walkable/vehicular	$\pm 3 \text{ hours} / \pm 12 \text{ hours}$
Elongation at break ISO 527-3	$> 350\%$
Tensile Strength ISO 527-3	$> 20 \text{ MPa (after 10 days)}$
Shore Hardness A/D DIN 53.505	$> 93 / > 50$
Solids content ISO 124	100%
VOC content	0
Abrasion resistance DIN-EN 5470-1	$< 3.000 \text{ mg}$
Permeability to CO ₂ UNE-EN1062-6	S d>50
Water vapor permeability EN-ISO 7783-1 y -2	Clas I
Capillary absorption and permeability to water EN-1062-3	$< 0.1 \text{ kg/m}^2/\text{h} \cdot 0.5$
Impact resistance EN ISO 6272-1	Class III
Resistance to thermal shock EN-13687-5	$> 1.5 \text{ MPa}$
Crack bridging ability EN-1062-7	A5 (-10°C), B4.2 (23°C)
Adhesion strength by pull-off test UNE-EN 1542	$> 1.5 \text{ MPa}$
Artificial weathering EN-1062-11	No blistering, no cracking, no flaking. Change of color, loss of gloss, and a little surface chalking
Diffusion coefficient to RADON gas ISO/DTS 11665-13	$4 \cdot 10^{-12} \text{ sqm/sec}$
Diffusion resistance to OZONE gas ISO 1431-1	PASS
Tear strength ISO 34-1:2011	$48 \text{ kN/m} (\pm 3)$



Non-migration to potable water at 60°C	BS-6920/WRAS	ABLE (check the official document) at 60°C max temp
Global migration (ethanol simulant at 20% and 10%)	EN 1186-1:2002 and EN 1186-3:2002	ABLE (check the official document)
Electrical volume resistivity	7 Electrical surface resistance DIN EN 62631-3-1/3-2	8,14*10 ⁻¹¹ Ω*m / 2,84*10 ⁻¹⁴ Ω

Results performed in the laboratory at 25°C (73°F) and 50% RH, under controllable conditions. These values may vary depending on the application, climatology, or substrate conditions.

* Data for component B pigmented in gray. For other colorations or neutral, consult the official COA issued by Tecnopol (Certificate of Analysis for each batch delivered). Results were performed in the laboratory at 23°C and 50% RH, under controllable conditions.

TECHNICAL AND CHEMICAL PROPERTIES (ACCORDING TO ETA 11/0357, BBA 16/5340)

PROPERTIES	RESULTS
Working life	W3:25 years at 1,4 mm.thickness
Climatic zone	S (hard weather)
Resistance to water vapor diffusion	EN 1931 μ=2,279
Water-vapor diffusion	ISO 7783 14g/sqm/day
Temperatures / User loads	P4: TH4, for all substrates at W2 / P4: TH4, for steel/concrete/OSB at W3
Roof slope	S1~S4, zero slope, ponding water admitted
Adhesion to concrete/steel/EPS/XPS/OSB/ceramic tile	1,70 MPa to 2,0/0,75 MPa/0,10 MPa/0,10 MPa/0,5 MPa/2,4MPa
External fire behavior	EN 13501-5:2007 A1:2010 Class. Broof (t1)+(t2)+(t3)+ (t4)
Fire reaction	EN-13501-1 Euroclass E
Resistance to movement	EOTA TR-008 according to 1,000 times
Anti roots certificate	EN 13948:2008 PASS

Results performed in the laboratory at 25°C (73°F) and 50% RH, under controllable conditions. These values may vary depending on the application, climatology, or substrate conditions.



ASTM TESTS

PROPERTIES	RESULT
Tensile strength ASTM D412:2016 (Method A)	3,659 psi (25.23 MPa)
Tensile strength ASTM D412-16:2021 (300% modulus)	1,831 psi (12.63 MPa)
Elongation at break ASTM D412:2016 (Method A)	658 %
Hardness Shore A/D ASTM D2240:2015	99/61
Tear strength ASTM D624-00:2012	101.5 N/mm
Water vapor transmission ASTM E96/E96M-16	0,18 g/sqm/day
Taber abrasion (H18 wheel, wear index) / (H22 wheel, wear index) ASTM D4060:2014	10.9 / 10.5
Resistance to water absorption ASTM D-570-98 (2018)	0%
Impact resistance ASTM G14-04:2010 e1	55.68 kg.cm
UV accelerated weathering (1000 hours) ASTM G154-16	No blistering/no cracking/no chalking/no peeling/no delamination
Crack Bridging ASTM C836/C836M:2015 and ADM/CE/002:2017	no cracks occurred after 10 cycles at 2 mm./ crack at 12 mm. width
Crack Bridging ASTM C1305/C1305M-16 and ADM/CE/002:2017	no cracks occurred after 10 cycles at 8 mm. / crack at 12 mm. width
Adhesion strength to steel/ concrete ASTM D4251:2017 (Method B, Tye I tester)	3.23MPa(468.47psi) / 2.20 MPa (319.09 psi)
Pull-off stenght ASTM D4541-22	2,334 psi
Hydrostatic pressure resistance ASTM D5385	100 psi/231feet of water/0.115 inches
Electrical / volume resistivity ASTM D257-14	2.65*10 ⁹ Ohm-cm

Results were performed in the laboratory at 25°C (77°F) and 50% RH, under controllable conditions. These values may vary depending on the application, climatology, or substrate conditions.

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