



POLYUREA MEMBRANE FOR WATERPROOFING AND COATING.

IS IT:

Product

Technology

Equipment

APPLICABLE FOR:

Restoration

Rehabilitation

New Construction

APPLICABLE ON:

1. Foundations and underground structures

2. Vertical structures

3. Horizontal structures and vertical connections

4. Roof and terraces

5. Façade and building envelope

6. Finishes and completion elements

7. Integrated services

8. General strategies for building recovery

Related companies: TECHNOPOL

DESCRIPTION

For roofing, waterproofing, and protection of:

Roofing: Sloped and flat roofs (walkable), balconies, and overhangs. (ETA 11/0357 "Liquid Applied Roof Waterproofing Kit, based on pure Polyurea" and BBA 16/5340).

Flooring: Car parks with heavy traffic, industrial floor surfaces with waterproofing and hard-wearing requirements (according to EN 1504-2); including an approved non-slip finish (ENV-12633:2003).

Bridge Deck: coating under the asphalt on concrete elements of civil engineering (ETA 16/0680 "Liquid Applied Bridge Deck Waterproofing based on pure polyurea").

Tanks and irrigation canals, potable water contact (according to BS-6920 and WRAS).

Retaining walls and foundations (EN 1504.2 "Products & systems for protection/repair of concrete structures").

Green roofs and walls (ETA 11/0357 Liquid Applied Roof Waterproofing Kit, and BBA 16/5340).

Power plants, recycling, water waste, water treatment, and petrochemical plants (EN-1504.2).

Swimming pools, aquariums, lakes. Near seawater.

Vehicle and boat coatings (bed liners).

Asbestos roof rehabilitation (use with TECNOFOAM G-2060 HFO, spray polyurethane foam system).

IRMA roofing system.

As a protection for an SPF (TECNOFOAM G-2060 HFO spray polyurethane foam system).

Minimum thickness	±1,5 mm
Tensile strength at 23°	>20 MPa
Elongation at break at 23°C	>350 %
Shore A hardness at 23°C	>93
Tack free time at 23°C	±5 secs
Working life	W3, 25 years

Application method	Spray equipment
VOC (volatile organic compounds)	0

WHY TO USE

TECNOCOAT P-2049 is a very strong solid membrane, flexible and hard-wearing product that, once applied, offers great stability, durability, and a perfect waterproofing and seal.

It holds:

ETA 11/0357 specific approval for "Liquid Applied Roof Waterproofing Kit, based on pure polyurea" working life 25 years (W3) with a minimum thickness of 1.4 mm, issued by EOTA (European Organization for Technical Assessment). The recommended thickness is 2 mm(2,1 kg/m²), but always consult our technical department or check our Technical Guidelines, depending on scope or use.

ETA 16/0680 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).

BBA certification n 16/5340 (validation on UK market and influenced) for walkable roofs.

French Certificate DTA 5.2-19-2665 (Avis Technique) issued by CSTB for deck roofing.

Its 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 (see the specific Technical Guideline).

Ponding water and works under ponding water (according to ETA 11/0357, ETA 16/0680, DTA 5.2-19-2665, and BBA 16/5340).

The properties of the *TECNOCOAT P-2049* system allow it to adhere to any surface such as concrete, ceramic tiles, metals, polyurethane foam (Tecnofoam G-2060 HFO), plywood, asphalt/bituminous sheets. In any case or

material, the surface must be consistent, firm, clean, and dry when the products are applied.

The application and training are done by spray equipment TC2049 (spray-equipment.tecnopolgroup.com) or similar.

Free from harmful VOC compounds, therefore, it does not hurt the ozone layer (VOC's zero).

TECNOCOAT P-2049 system is 100% recyclable by mechanical means friendly to the environment; no gas collection for recycling and/or destruction is required; it doesn't emit substances to the environment once installed.

Thanks to its versatility and its tack-free time of around 5 seconds (reduces facility downtime) *TECNOCOAT P-2049* adapts to any surface, making it the ideal product for application on uneven surfaces and in areas of any shape, whether curved or squared.

TECNOCOAT P-2049 system's properties enable it to bond to any surface, such as concrete, ceramic tiles, polyurethane foam, wood, metals, bituminous sheets, acrylic paints (for other surfaces, please contact us).

Furthermore, due to its resistance, it can be walked on, and it will accept a rough finish to make it non-slip (according to ENV 12633:2003)

Applying *TECNOCOAT P-2049* saves in seals and any other kind of joins, as the finish is uniform and makes up a single layer, providing a surface with optimum maintenance and cleaning properties.

TECNOCOAT P-2049 pure polyurea coating system 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).

TECNOCOAT P-2049 is immune to ambience temperature changes of between -40° to 140°C, conserving its elastic properties without becoming cracked or soft.

The range of ambience temperatures of application is between 3°C to 35°C. Max. relative humidity 85%.

The fast reaction of *TECNOCOAT P-2049* upon application provides great stability in a few seconds and it may be walked on and guarantees waterproofing in less than 3 hours. This polyurea coating reaches its optimum conditions after approximately 24 hours.

Contact with fuels, fertilizers, animal excrements or urine does not soften *TECNOCOAT P-2049*.

HOW TO USE AND APPLY

In general, you should take the following factors:

- Repair the surface (fill in depressions, eliminate unevenness, eliminate any old waterproofing, etc.)
- Singular points preparation(perimeter, sinks / evacuations, expansion joints or structural)
- Remove any silicone-based products
- The surface must have enough compressive strength of adhesion of the membrane. If it were not so, we will proceed to apply our primers resins to achieve this target
- Clean up the surface or substrate, removing any dust, dirt, grease, or efflorescence.
- The *TECNOCOAT P-2049* pure polyurea system can be applied to many different surfaces and the procedure will vary depending on its nature or state.
- It's necessary to mix the two initial liquid components, isocyanates, and amines by the spray equipment TC2049 (spray-equipment.tecnopolgroup.com) or similar (proper maintenance and cleaning is recommended).

The general parameters for this material will be the following:

Heater isocyanate temperature: ±75 °C

Heater amines temperature:±70°C

Hose temperature:±70 °C

Pressure: 2.700 psi (185 bar)

Recommended Mixing chamber: GU-07008-1 or GU-07008-2

These temperature and pressure parameters must be valued, ratified, or be varied by the applicator, depending on the conditions of each climate zone, weather situation, or projection equipment specifications.

Concrete substrate:

- Any depressions or voids should be repaired using our epoxy resin PRIMER EP-1010.

- The 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.
- Any concrete latencies or release agents should be eliminated and an open pore surface achieved by grit blasting, milling, or sanding (to achieve a Concrete Surface Preparation index -CSP- 3 to 6 from ICRI Guide 03732, depending on the final use). Recommended CSP 3 or CSP 4.
- On old concretes, some acid-etched is needed to open the pores for primer acceptance
- Clean up and eliminate all contaminants from the elements, such as dust or particles from the previous processes.
- Apply the primer in the conditions and with the parameters indicated in the technical specifications for these products. In general, the two-component polyurethane PRIMER PU-1050/PRIMER PUC-1050, the epoxies PRIMER EP-1010, PRIMER EP-1020, or PRIMER EPw-1070 should be used, to promote adherence to the concrete surface, reduce the pinhole appearance, and absorption of moisture in the substrate (please check the primers absorption capacity in the TDS).
- Apply the *TECNOCOAT P-2049* pure polyurea coating.
- Application of the aliphatic resin *TECNOTOP S-3000/2C/2CP/1C* in consumption and desired thicknesses in the case of no protection against UV rays. This application can be done with a short nap roll or electrical "airless" equipment(consult the TDS of these products before use).

Ceramic substrate

- Ceramic surfaces should not have empty joints or loose elements or parts. These should be filled with MASTIC PU mastic, complemented with TECNOBAND 100 on the joints if necessary.
- For quick and efficient cleaning of the surface use pressurized water and check that it evaporates completely. Also, verify that all dust and other physical contaminants have been eliminated.
- Next, apply the required primer; in these cases of non-porous surfaces use PRIMER EP-1040, PRIMER EP-1010, or PRIMER EPw-1070.

- Apply the *TECNOCOAT P-2049* pure polyurea coating.
- Application of the aliphatic resin *TECNOTOP S-3000/2C/2CP/1C*, in consumption and desired thicknesses in the case of no protection against UV rays. This application can be done with short hair roller type equipment "airless" (consult the TDS of these products before use).

Sheets substrate:

- The existing sheet surfaces (bitumen, EPDM, PVC, asphalt ...) must not show surface areas raised or not in good condition. He withdrew to poor areas.
- Rolled roofing of any type should be in good condition prior to application; check the situation of the sheets and value the actions to do.
- There shall be cleaned with water to complete evaporation.
- Remove and replace some sections if needed.
- Next to apply the required primer; in these cases of non-porous surfaces use the water-based epoxy PRIMER EPw-1070.
- Apply the *TECNOCOAT P-2049* pure polyurea coating.
- Application of the aliphatic polyurethane resin *TECNOTOP S-3000/2C/2CP/1C*, in consumption and desired thicknesses in the case of no protection against UV rays. This application can be done with short hair roller type equipment "airless" (consult the TDS of these products before use).

Metal substrate (see *TECNOCOAT P-2049* EL TDS)

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 extends 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 are applicability-based solvents for reducing this type of surface cleaning.

- Apply a thin layer (50-100 g/m²) of polyurethane resin PRIMER PU-1000.
- Light spread SILICA SAND over the wet primer applied before.
- Wait for the total drying.
- Apply *TECNOCOAT P-2049, TECNOCOAT CP-2049, TECNOCOAT CP-2049 PLUS, DESMOPOL* (with *DESMOPLUS* or *DESMOPLUS 700*).
- Apply *TECNOTOP S-3000/2C/2CP/1C*, in consumption and desired thicknesses in the case of no protection against UV rays. This application can be done by short hair roller type equipment "airless" (see the conditions of application in the product datasheet TDS).

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 are applicability-based solvents for conducting this type of surface cleaning.
- Apply a thin layer (50-100 g/m²) of polyurethane resin PRIMER PU-1000.
- Light spread SILICA SAND over the wet primer applied before.
- Wait for the total drying.
- Apply *TECNOCOAT P-2049, TECNOCOAT CP-2049, TECNOCOAT CP-2049 PLUS, DESMOPOL* (with *DESMOPLUS* or *DESMOPLUS 700*).
- Apply *TECNOTOP S-3000/2C/2CP/1C*, in consumption and desired thicknesses in the case of no protection against UV rays. This application can be done by short hair roller type equipment "airless" (see the conditions of application in the product datasheet TDS).

TECHNICAL CHARACTERISTICS

TECHNICAL DATA (ACCORDING TO ETA 11/0357 AND BBA 16/5340, FOR ROOFING, EUROPEAN GUIDE 005):

PROPERTIES	RESULTS
Density at 23 °C ISO 1675	1,10 g/cm ³
Elongation at break at 23 °C ISO 527-3	>350%
Tensile Strength at 23 °C ISO 527-3	>20 MPa after 10 days
Shore Hardness (A) at 23°C DIN 53.505	>93
Shore Hardness (D) at 23°C DIN 53.505	>50
Working life	W3:25 years
Minimum thickness	1,4 mm
Tack-free time at 23 °C	±5 seconds
Cured time at 23 °C	10 seconds~48 hours
Climatic zone	S (hard weather)
Surface service temperatures	-20 °C~90 °C
Resistance to water vapor diffusion EN 1931	μ=2.279
Water vapor diffusion ISO 7783	14g/(m ² /day)
User load	P4 (green roof, heavily loaded)
Roof slope	S1~S4, zero slope

External fire behavior EN 13501-5:2007 A1:2010	Class. Broof (t1)+t2)+(t3)+ (t4)
Fire reaction	Euroclass E
Resistance to movement EOTA TR-008	according to 1.000 times
VOC content ISO 124:2014	0
Anti-roots certificate EN 13948:2008	YES
Chemical resistance	Resistant to many products and chemicals (consult technical department)
Ambiance thermal resistance	It behaves consistently with a temperature range of -40°C~ +140°C

The values in this table are approximate and can vary depending on the situation of the support, climatology, or application methodology employed.

ASTM CERTIFICATIONS

PROPERTIES	RESULT
Tensile strength ASTM D412:2016 (Method A)	25,23 MPa
Elongation at break ASTM D412:2016 (Method A)	658 %
Hardness Shore A ASTM D2240:2015	99
Hardness Shore D ASTM D2240:2015	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) ASTM D4060:2014	109,0
Taber abrasion (H22 wheel, wear index) ASTM D4060:2014	105,0
Water absorption ASTM D570-98:2018	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	1.-no cracks occurred after 10 cycles at 2 mm. 2.-crack at 12 mm width.
Crack Bridging ASTM C1305/C1305M-16 and ADM/CE/002:2017	1.-no cracks occurred after 10 cycles at 8 mm. 2.-crack at 12 mm. width.
Adhesion strength to steel ASTM D4251:2017 (Method B, Tye I tester)	3,23 MPa
Adhesion strength to concrete ASTM D4541:2002 (Method A, Tye I tester)	2,20 MPa

TECHNICAL DATA OF COMPONENTS (ACCORDING TO ETA 11/0357 FOR ROOFING, EUROPEAN GUIDE 005)

PROPERTIES	COMPONENT A	COMPONENT B
Specific gravity at 23°C ISO 1675	1,11±5%g/cm ³	1,09 ±5%g/cm ³ *
Viscosity (S63, 30 rpm at 23 °C) ISO 2555	900±50 cps	650±50 cps *
Mix ratio – in weight	100	102
Mix ratio – in volume	100	100

OTHER CERTIFICATIONS

PROPERTIES	RESULT
Tear strength at 23°C ISO 34-1:2011	48 kN/m (±3) (check the official document)
Non-migration to potable water BS-6920 and European Directive 98/83/CE	ABLE (check the official document)
Global migration (ethanol simulant at 20% and 10%) EN 1186-1:2002 and EN 1186-3:2002	ABLE (check the official document)
Depth of water penetration DIN 1048 Pt5:1991	10 bar/0 mm
Max. tensile strength ISO 37 at 7 days internal test	28 MPa
Max. elongation ISO 37 at 7 days internal test	345%
Modulus 100% ISO 37 at 7 days internal test	11 MPa

*: these data only in a neutral color; for other colors, this data may vary, please check COA.

RECOMMENDATIONS AND OTHER INFORMATION

Consult in all cases the waiting times, drying time, singular points treatment, conditions of application of all the products through the technical data sheets of each product, the technical handbook of application of *TECNOCOAT*, or consult our technical department.

For other types of supports/substrates, for further information on the execution application procedure, for any additional questions, please, consult the technical data sheets (TDS) of these products, or the company's technical department.

These guidelines are valid although they can be modified, according to the situation of the supports, conditioning of the bearing structures of the elements to be waterproofed, external climatology, or situation at the time of application.

Its application is recommended directly on the structural concrete slabs. The product is certified to be applied at zero slopes (ETA 11/0357, ETA 16/0680, DTA 5.2-19-2665, and BBA 16/5340). In this way, the execution of mortar slopes or other protective materials is not necessary to do.

The *TECNOCOAT P-2049* system requires solar radiation protection (UV rays) to not lose its physical and mechanical properties, given that it is an aromatic membrane. Therefore, our EOTA (European Organization for Technical Assessment) approved systems (ETA 11/0357 and 16/0680) and BBA 16/5340, 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*, our polyaspartic resin for coating and UV protection.

PACKAGING:

Metal drums of 225 kg each component (B side: amines and A side: isocyanates). Agitate B side (AMINES) before inserting the transfer pump and use.

Metal drums of 60 kg each component (B side: amines and A side: isocyanates). Agitate B side (AMINES) before inserting the transfer pump and use.

SHELF LIFE: 12 months at temperatures between 41 to 95 °F (5°C to 35°C), provided it is stored in a dry place,



kept away from direct sunlight, extreme heat, cold or moisture. Once the tin has been opened, the product must be used immediately. Once opening the drum, B side must be agitated mechanically before inserting the transfer pumps and use.

HEALTH AND SAFETY: 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. Always read the MSDS before use and handling the product.

- **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 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.
- Vapor and atomized liquids are harmful.
- Use only in ventilated areas, wear approved respirators when necessary.
- Keep out of reach of children.
- Do not use near high heat or open flame.

EXAMPLES

Casa Coca, Barcelona, Spain. See images 3, 4, 5, 6.

Applied hot, it is a waterproofing solution that overcomes the problems of traditional waterproof sheets, thanks to its high tensile strength, the absence of joints or discontinuities and adaptation to any surface, however irregular it may be.

REFERENCES / SOURCES AND LITERATURE

<https://www.tecnopolgroup.com/gama-tecnocoat/tecnocoat-p-2049>

https://www.youtube.com/watch?v=_9DnATeGaDE&t=1s

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Z. Wu. Application of spray polyurea in Architecture (2018) *International Journal of Science*, vol. 5. <http://www.ijscience.org/download/IJS-5-2-175-178.pdf>

WEBSITE OF THE COMPANY

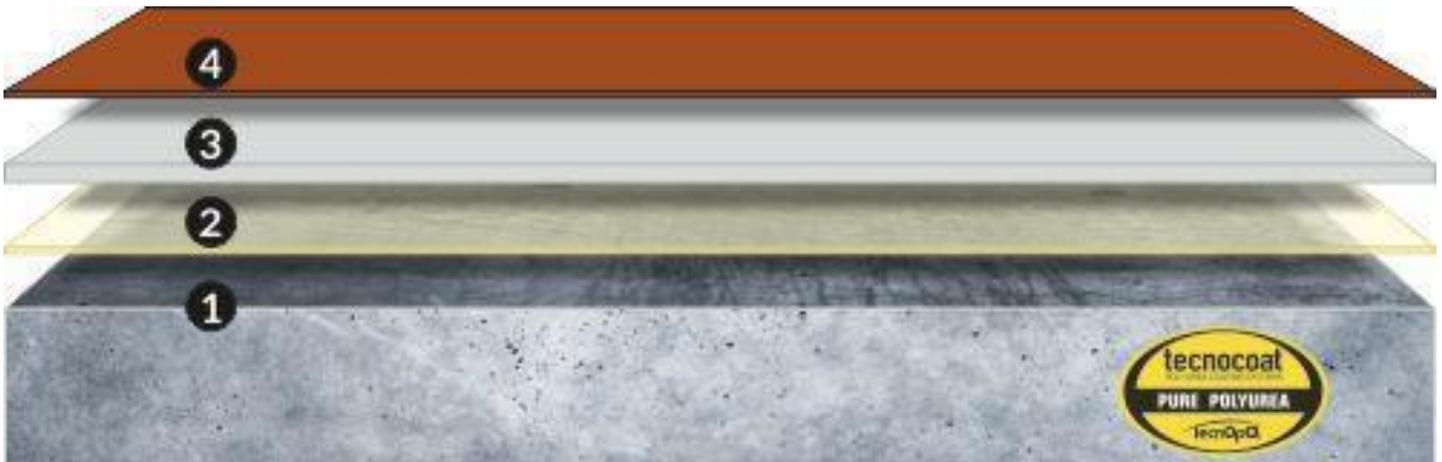
<https://www.tecnopolgroup.com/>



IMAGES AND CAPTIONS



Fig.1-2: Application of the product with a spray; Packed product. ©TECHNOPOLGROUP.COM



1. Support Preparation | 2. Primer Coat | 3. Membrane TECNOCOAT | 4. Finish Coat (Optional).

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Fig.3-4: Application of the product with a spray; 3 seconds later can be stepped on, Casa Coca. ©Belén Onecha



Fig.5-6: Details usually difficult to solve on terraces and roofs, Casa Coca. ©Belén Onecha