desmopol
LIQUID MEMBRANES

POLYUREATEC
POLYUREATEC GMBH
Jakob-Kaiser-Straße 8 · 47877 Willich
Tel. +49/21 54/8 88 69 90 · Fax +49/21 54/8 88 69 92
info@polyureatec.de · www.polyureatec.de

ROOFTOP GARDENS
WATERPROOFING SYSTEM

TECHNICAL GUIDELINE



Tecnopol®
we develop value.com





ETE 10/0121

BBA 16/5340

EN 13948

ROOFTOP GARDENS
WATERPROOFING SYSTEM

Rooftop systems are a very useful systems that wear the top of the buildings and provide multiple actions such as absorbing rainwater, providing insulation, creating an habitat for wildlife and decreasing stress of the people, providing a more aesthetically pleasing landscape, and helping to lower urban air temperatures and mitigate the heat island effect.

All the concrete structures need to be protected from the rainwater, of course. In this case, using vegetation as a " green natural finishing", its need to be protected from the irrigation water too.

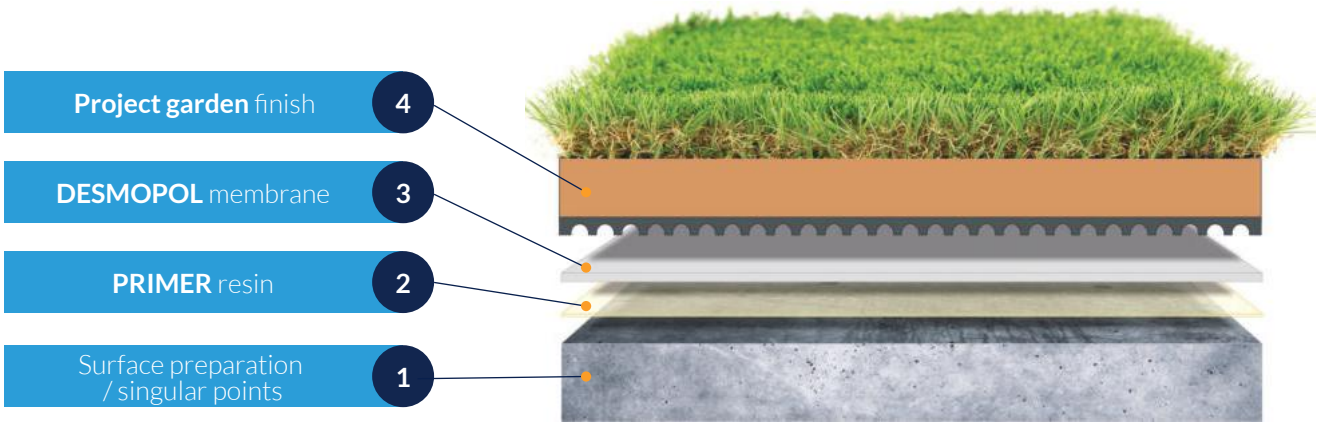
DESMOPOL, creates a seamless, continuous skin all over the concrete element protecting it and avoiding the risk of leaks or roots penetration. Furthermore, this polyurethane membrane, is perfectly water highness, waterproof, ponding water work and supporting the weight of the plantation soil. This system is approved by EOTA y BBA according European norms (ETA 11/0357 and BBA 16/5340)

CE

EN 1504-2



Rooftop gardens
General outline



BENEFICIOS

1. **Plant root penetration approval according to EN-13948** (ETA 10/0121 and BBA 16/5340)
2. **Fully adhered systems:** protection of the structural support element. (CE marking under EN-1504-2)
3. **Complete and absolute protection** of the construction element.
4. **Zero slope application.**
5. **Direct application to the existing substrate:** waste generations limited, which contributes to an improvement in the construction sustainability.
6. **Faster setting:** labor time reduction, cost optimization.
7. **No extra weight on existing structure** (only ±2.5-3 kg/sqm).
8. **Cost reduction:** not need to apply mortar coats to protect it.
9. **Several finishing** (colors and surface textures), according to the existing slippery international approvals and regulations.
10. **High resistance to the temperature:** no collapse of the membrane due to environmental causes.
11. **Working life (W3:25 years):** high quality of the applied system+ maximum durability warranties.

Application parameters
Preliminary considerations

For optimum application of the **DESMOPOL** system (adherence, required use, decorative finish and/or applicable regulations) conditioning aspects, such as weather and physical properties of the substrate, need to be identified.

SURFACE HUMIDITY/WATER

Humidity on the substrate can affect the membrane's adherence. Humidity or the presence of water in/on the substrate hamper adherence, which will have a negative effect on their final result of the system. It is recommended that they system is not applied before the concrete curing process has finalized (28 days)

It is essentially the application of the product is aware of and takes into consideration this aspect, carrying out the corresponding verifications in all areas of the substrate in order to decide on the type of primer to be used, or whether or not other treatment is required. (vapor barrier)

The different types of humidity or presence of water in/or the substrate or their characteristics may be as follows:

- **Liquid water/moisture:** There must not be any water present, whatever the type of substrate, as the will completely annul the membrane's adherence (in some cases, use **PRIMER WET**, please, check our technical department)
- **Hydrostatic water:** The existence of rising damp, (water coming up through the element), is not compatible with continuous membrane WATERPROOFING SYSTEM and, therefore, this situation will have to be resolved via on-site application of water-vapor permeable hydraulic materials or the installation of floating floors, etc.
- **Dew point:** This is a factor to take into consideration at the start of applying systems such as ours, which for the most part are used outside and deepened, as mentioned, on a level of control of the substrate humidity. The appearance of humidity from dew depends on the air and substrate temperature and the relative ambient humidity. To prevent this, the substrate's temperature should be 3 degrees Celsius above that corresponding to the dew point (see the universal dew point charts).

TSUBSTRATE AND AMBIENCE TEMPERATURES

These are two conditioning aspects that could affect the membrane curing process, along with that of the ambient temperature.

- Ambience range of temperatures: 3ºC to 45ºC
- Substrate range of temperatures: 5ºC to 40ºC

Although, based on our experience and due to the chemical nature of some of the products that make up the system, we do not recommend working at ambient temperatures below 3ºC.

SUPPORT'S PHYSICAL CONDITIONS

Coating performance is dependent on adequate surface preparation and application.

The optimal surface preparation will increase the bonding on the surface, and this is essential for three reasons:

- Good bond allows the structure and coating to work as one and maintain stability.
- Prevents salt and contaminated water from leaking through the concrete (extremely important in steel, to protect from rust and corrosion).



The system does not allow the presence of water on the back of the substrate.

1a. Surface Preparation

CONCRETE

The concrete surface, where we go to apply our waterproofing system, needs to be prepared, as follows:

- Remove oils, greases, silicones or other contaminants.
- Fill the depressions on the surface (caused during the concrete pouring process), using **PRIMER EP-1010** epoxy mortar. Fill fissures and cracks using **MASTIC PU**.

Finally, a mechanical preparation is needed, to get a uniform roughened surface and to remove the laitances, using one of these systems, thus achieving a flat surface with a continuous roughness (CSP 4 to 6), following the ICRI recommendations.

People applying the system must decide in each case the most suitable method, depending on the conditions of the substrate or surface or the desired result (always in combination with the primer to be used).

To complete these processes prior to application, the substrate must be cleaned using dry systems (vacuum cleaner).

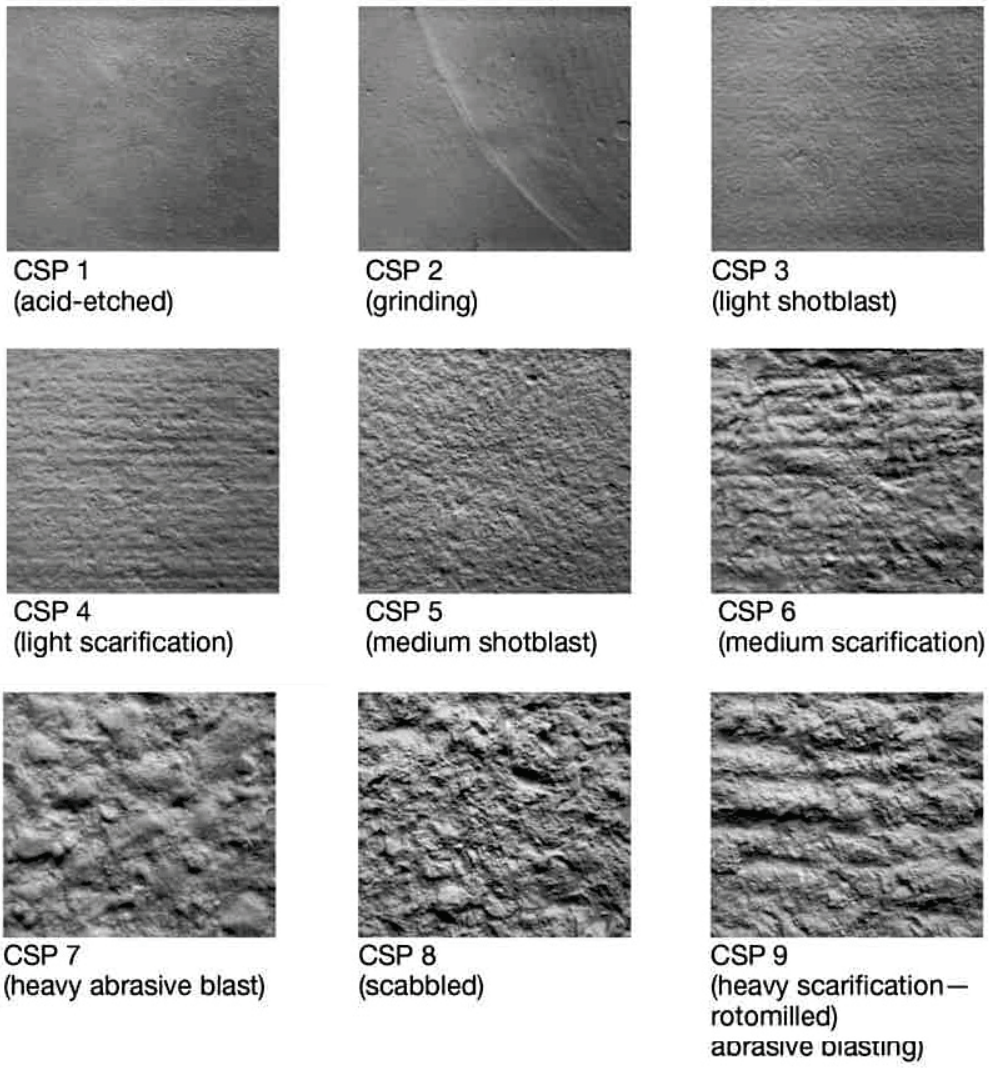




PROCESSES TO ELIMINATE THE LAITANCE ON THE CONCRETE

Grinding/Milling:
Using a rotary machine with specialty grinding wheels with tungsten carbide; this method is suitable for removing concrete paste and other hard substances. It causes surface erosion by rubbing with stones or hard sanding discs. This removes the softest parts of the surface, for example surface laitance, which sometimes occurs during concrete pouring or curing. But is not suitable for soft existing coatings or when the friction caused heat meets this product.

Sandblasting:
Generally employs sand or a sand type of abrasive shot by compressed air through a nozzle. Sandblasting is recommended for horizontal, vertical, and overhead use. This method is recommended for removal of the surface of concrete, existing sealers, and hard coatings. Creation of dust may be prohibited by environmental regulation. Vacuum mechanisms are available to remove dust from the air. Wet sandblasting is available that complies with environmental regulations. Remove shot material, dust, and mud residues according to environmental regulations. This method of surface preparation, while highly effective, has lost utility where environmental regulation has restricted its use.

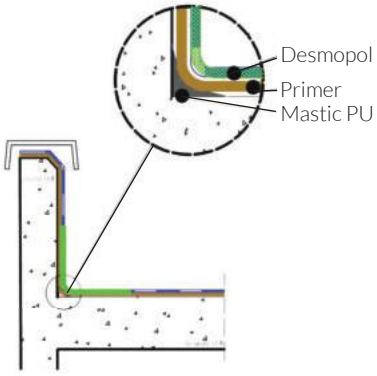


Finishing profiles according to ICRI

Ensure that there isn't the presence of contaminants such as oils, greases, silicones... (as additives used in the pouring process of the concrete).

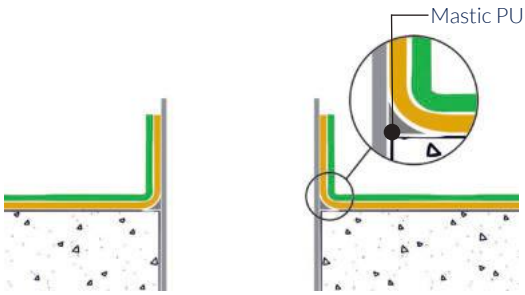


1b. Singular points



VERTICAL SURFACES
(FLASHING, UPSTANDS, SHARP EDGES)

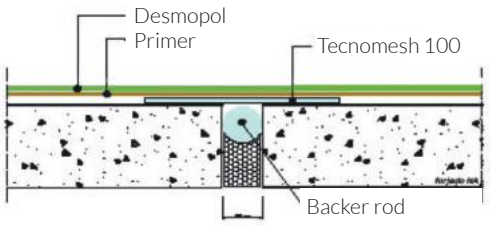
1. Coving at the point of contact, to provide a good surface for the vertical rotation of the membrane, using **MASTIC PU**, or common mortar.
2. Final membrane's edge, to ensure that not water, rain filter out within the membrane and the wall.
3. In turns or sharp edges on the top of the wall, it should cut them about 45 ° to avoid breakage due to an internal punching.



PIPELINES

Smooth any encounter with pipes or any other element that crosses the support with **MASTIC PU**. This provides a good surface for the vertical rotation of the membrane.

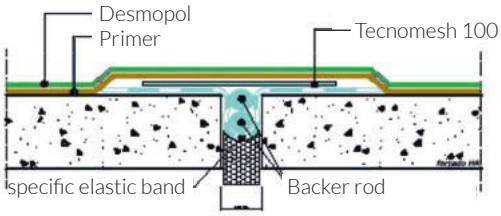




Simple joint

JOINTS

Cleaned and filled with **MASTIC PU** elastic polyurethane filler (never use silicone), apply the **DESMOPOL** system with **TECNOMESH 100** intermediate mesh and a top protection with a geotextile layer to absorb the movements of the joint.



Expansion joint

EXPANSION JOINTS

In the case of expansion joints, the stress to be absorbed is greater and, therefore, this element should be treated as a structural element and using special seal the **specific elastic band**. They should be applied and installed in the areas subject to structural movements according the TDS.



2. Primer resin

The use of primers when applying the complete **DESMOPOL** membrane system is important and essential and it is indicated in the approval and certification documentation available of **DESMOPOL** (ETA, BBA).

MAIN PERFORMANCES

- Increase bonding
- Fill irregularities to the existing surface
- Surface moisture absorption, present in the surface during the application process

APPLICATION METHODOLOGY

1. Check expiry time (existing on the pail label).
2. Open the pails and check visually the product.
3. Prior to mixing, stir component A separately to homogenize it.
4. Add the component B into the component A pail (make sure the component B is fully emptied into the component A).
5. Mix both components using a low speed electric mixer (300 to 400 r.p.m.).
6. Apply by short nap roller, brush or squeegee. The number of coats depends on the physical surface conditions; in most of cases is necessary to apply 2 crossed coats. Wait for the tack free time between coats. You can use airless equipment too, but the pot- life time must be checked to clean the equipment within the indicated time.You can use airless equipment too, but the pot-life time must be checked in order to clean the equipment within the indicated time.



This process requires a flat, clean and dry substrate and as hard as possible.



In the tables below you can see the main properties of available primers to use in this system. Pay attention to the "accepted surfaces" and "maximum surface dampness" to make the best choice of primer resin.

	primer EP-1010	primer EP-1020	primer EP-1040	primer EPw-1070
Main use	Surfaces in low-damp conditions	Surfaces in low-damp conditions	Metal surfaces	Surfaces in medium-damp conditions
Accepted surface	Hormigón / Cerámica	Hormigón / Cerámica	Metal / Cerámica / Hormigón	Hormigón, asfalto
Components No.	2	2	2	2
Product base	Epoxy 100% solids	Epoxy 100% solids	Epoxy 100% solids	Epoxy water based
Density	± 1,50 g/cm^3	± 1,05 g/cm^3	± 1,05 g/cm^3	± 1,00 g/cm^3
Solids content	100 %	100 %	100 %	> 60 %
Concrete adherence	> 2 MPa	> 2 MPa	> 2 MPa	> 2 MPa
Yield per coat	± 250 g/sqm	± 150 g/sqm	± 150 g/sqm	± 100 g/sqm
Initial drying time	50 minutes	60 minutes	60 minutes	5 ~ 6 hours
Recoat time	3 ~ 24 hours	3 ~ 48 hours	4 ~ 48 hours	6 ~ 48 hours
Temperature of use	5 ~ 35ºC	5 ~ 35ºC	5 ~ 35ºC	5 ~ 35ºC
Maximum surface dampness	4 %	4 %	4 %	± 10 %
Dilution on water	NO	NO	NO	5 ~ 20 %

	primer PU-1000	primer PU-1050	primer PUc-1050	primer WET
Main use	Surfaces in low-damp conditions	The best option for concrete	For concrete in cold environments	Concrete subject to maximum damp
Accepted surface	Reparación y solapes de membranas	Concrete	Concrete	Concrete
Components No.	1	2	2	2
Product base	Polyurethane solvent based	Polyurethane 100% solids	Polyurethane 100% solids	Epoxy 100% solids
Density	± 1,11 g/cm^3	± 1,11 g/cm^3	± 1,11 g/cm^3	± 1,50 g/cm^3
Solids content	> 80 %	100 %	100 %	100 %
Concrete adherence	> 2 MPa	> 2 MPa	> 2 MPa	> 2 MPa
Yield per coat	± 100 g/sqm	± 150 g/sqm	± 150 g/sqm	± 450 g/sqm
Initial drying time	60 minutes	60 minutes	60 minutes*	3 hours
Recoat time	3 ~ 24 hours	3 ~ 24 hours	3 ~ 24 hours*	3 ~ 6 hours
Temperature of use	5 ~ 35 ºC	5 ~ 35 ºC	5 ~ 15ºC	5 ~ 35ºC
Maximum surface dampness	4 %	± 4 %	± 4 %	± 98 %
Dilution on water	NO	NO	NO	NO

*Yield can vary depending on the substrate condition.

3.Desmopol Membrane

DESMOPOL is a solvent-based polyurethane resin that, once cured, forms a solid, continuous membrane without joints or overlaps that perfectly waterproofs the applied surface. It is a product that achieves a solid state through contact with ambient humidity, although it is also possible to add additives to control its drying time, increasing its mechanical characteristics, forming a 100% solid section membrane.

The system is completely watertight, making it suitable for pedestrian traffic.

The waterproofing system has the European Technical Assessment ETA with the n. 10/0121 and the certificate for the British market BBA 16/5340, for roof waterproofing systems and resistance to root penetration for a minimum thickness of 1.2 mm of membrane, consumption approx. 2.00 kg//sqm (recommended 1.5 mm/2.4 kg/sqm), useful life of 25 years (W3). This thickness is the one used to obtain the evaluation and can be increased according to end uses or substrate situations.

DESMOPOL is presented in metal containers in these formats: 6kg, 15 kg and 25 kg.

DESMOPOL has certification ETA 10/0121, BBA 16/5340 and DTA 19/2665 including anti-roots penetration, at 25 years working life, a minimum thickness of 12 mm (recommended thickness around 1,5 mm, consumption ±2.4 kg/sqm).

Shelf life is12 months at temperatures between 5°C to 35°C (41 to 95 ªF), provided it is stored in a dry place, keep away from direct sunlight, extreme heat, cold or moisture. Once the tin has been opened, the product must be used immediately.

For the repair and overlaps processes, please see the TDS.





APPLICATION METHODOLOGY

Once the substrate has been prepared and the primer has been applied, depending on the conditions, the polyurethane membrane shall be applied according to the following methods:

Aplicación por capas (tradicional o clásica)

- Open the can of **DESMOPOL** and stir well until homogenised.
- Spread with a short nap roller a first layer with a thickness of approx. 0.7 mm (1.2 kg/sqm). (1.2 kg/sqm). Apply the material without dilution.
- Wait for complete drying (which will depend on weather conditions), approximately 5~6 hours.
- Apply the next coat, with the same conditions as above.
- Repeat this process as many times as necessary to achieve the desired final thickness of the film.

Application by layers with intermediate mesh (with the use of TECNOMESH 100)" Wet and Wet System".

To be used on ceramic substrates, asphalt sheets, in general, on cracked substrates, or substrates with contraction or expansion movements.

- Open the can of **DESMOPOL** and stir well until homogenised.
- Spread with a short nap roller a first layer with a thickness of approx. 0.7 mm (1.2 kg/sqm). Apply the material as it is used, without extra dilution.
- Spread the **TECNOMESH 100** mesh over the previous layer, which is still wet. To do this, use a dry roller to press the mesh into the resin layer.
- The next coat of **DESMOPOL** is applied directly on top of the previous coat, which is still wet. The consumption in this type of application may increase compared to the theoretical consumption without the use of a mesh.

Single coat application (with addition of DESMOPLUS or DESMOPLUS 700)

- Pour **DESMOPLUS** or **DESMOPLUS 700** into the **DESMOPOL** can, always in the fixed proportion given by the manufacturer.
- Continuous mixing with medium speed mechanical equipment. Check the mixing time.
- Pour the formed material onto the substrate and spread it on the surface. This operation is carried out with the help of a notched trowel or rubber lip (a roller can also be used).
- This is a unique process, through which the desired thickness is obtained in a single operation, eliminating intermediate waiting times, ensuring the formation of the membrane without interior bubbles, conferring more resistance to traction and reducing the final drying time.

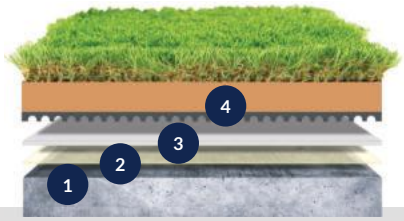
When adding **DESMOPLUS** or **DESMOPLUS 700**, do not use mechanical application equipment (airless type).
If it is necessary to add **DESMOTHIX** due to the slope of the element to be waterproofed, add maximum 250 ml (on the 25 kg drum of **DESMOPOL**).







Application summary



GARDEN1 · DESMOPOL

	PRODUCT	TYPE OF SURFACE	EXISTING SURFACE HUMIDITY	APPLICATION METHOD	YIELD	THICKNESS
1	**Surface preparation**					
2*	**PRIMER EPw-1070**	Concrete	± 10 %	• Apply by roller or electrical equipment.	150 ~ 250 g/sqm	90 µ ~ 150 µ
	PRIMER EP-1020	Concrete/ Ceramic	± 4%	• Apply by roller.	200 g/sqm	190 µ
	PRIMER EP-1010	Concrete/ Ceramic	± 4%	• One coat application by squeegee.	± 300 g/sqm	200 µ
	PRIMER PU-1050	Concrete	± 4%	• Apply by roller.	150 ~ 300 g/ sqm	135 ~270 µ
	PRIMER PUc-1050	Concrete cold weather	± 4%	• Apply by roller.	150 ~ 300 g/ sqm	135 ~270 µ
	PRIMER WET	Concrete/ Ceramic	± 98%	• One coat application by trowel.	450 ~ 500 g/ sqm	290 ~325 µ
3	**DESMOPOL**	-		• Recommended single coat application with addition of Desmoplus or Desmoplus 700.	2,4 kg/sqm	1,5 mm
4	**Project garden finish**					

*Choose primer according surface type and humidity.



Approved by official certification agencies

- **EOTA CERTIFICATES**
  European TECHNICAL ASSESSMENT (ETA10/0121)
  DESMOPOL holds an ETA certificate (W3 25 working life years). This approval is based on a European technical approval guideline (EAD 030350-00-0402) which approves the suitability of the product for its specified use, based on compliance with the essential requirements as "Liquid Applied Roof Waterproofing based on polyurethane". Including plant roots penetration according to the EN-13948 for use in green-roofs.

- **BBA CERTIFICATE**
  UK TECHNICAL ASSESSMENT (BBA 16/5340)
  DESMOPOL holds a BBA certificate for the British market (w3 25 working life years) and regulates aspects as weather resistance, reaction to fire, adherence to substrates, pedestrian and road traffic resistance to plant roots penetration and working life for over 25 years.

- **CE MARKING UNDER EN 1504-2 APPROVAL**
  PROTECTION AND REPAIR OF CONCRETE STRUCTURES
  DESMOPOL holds an EN 1504-2 certificate, the official European approval for products and systems designed for the protection and repair of concrete structures.





Legal Notes

- Check TDS and MSDS of all the materials before use.
- Technical data and any other information are true and accurate to the best of our knowledge.
- The use of these products is beyond the control of
- Consumptions can vary due surfaces, machine maintenance status or weather conditions
- This is a technical document, without legal value
- Proper application is the responsibility of the buyer
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NOTES

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POLYUREA**TEC**

POLYUREA**TEC** GMBH
Jakob-Kaiser-Straße 8 · 47877 Willich
Tel. +49/21 54/8 88 69 90 · Fax +49/21 54/8 88 69 92
info@polyureatec.de · www.polyureatec.de

TECNOPOL SISTEMAS, S.L. | c/ Finlàndia 33 · CP: 08520 · Les Franqueses del Vallès · Barcelona (Spain) · Telf. (+34) 93 568 21 11