

PURTOP 1000

Two-component, solvent-free pure polyurea membrane applied by spray with a high-pressure, bi-mixer type pump, to form waterproof coatings for hydraulic works, roofs and bridge decks directly on site



BENEFITS AND FEATURES

- Solvent-free and “no VOC” (volatile organic compounds)
- Immediate waterproofing and set to light foot traffic
- Excellent tensile and tear strength
- High crack-bridging capacity, both static and dynamic, even at low temperatures
- Resistant to root penetration according to EN 13948
- Excellent resistance to alkalis and diluted acids
- No reinforcement required
- Does not form overloads on load-bearing structures

WHERE TO USE

Thanks to its high chemical resistance, exceptional flexibility and tear strength, **Purtop 1000** is suitable for waterproofing membranes on bridge decks and hydraulic works as well as for all structures requiring a high-performance waterproofing membrane. The special properties of **Purtop 1000** also make it suitable for waterproofing both new and existing structures.

Some application examples

- Waterproofing roof gardens and inverted roofs.
- Waterproofing metal sheet roofs.
- Waterproofing bridge and viaduct decks.
- Waterproofing basins, storage tanks and hydraulic structures in general.
- Waterproofing storage tanks and cisterns for drinking water.

CERTIFICATIONS

- **Purtop 1000** complies with the principles defined in EN 1504-9 (*“Products and systems for the protection and repair of concrete structures: definitions, requirements, quality control and evaluation of conformity. General principles for use of products and systems”*) and the requirements of the EN 1504-2 coating (C) according to principles PI, MC, PR, RC and IR (*“Surface protection systems for concrete”*).
- **Purtop 1000** is approved, within RFI (Italian Railway Network), for the waterproofing of railway bridges, in the manner provided for by the General Technical Tender Specifications of RFI's Civil Works, with an application

thickness ≥ 3 mm.

- Resistant to root penetration according to CEN/TS 14416 and to EN 13948;
- Suitable for contact with drinking water according to Italian Ministerial Decree DM 174/04.

TECHNICAL CHARACTERISTICS

Purtop 1000 is a two-component, solvent-free, pure polyurea resins formulation according to a formula developed in MAPEI R&D laboratories.

Purtop 1000 must be applied in layers at least 2 mm thick and its very short reaction time means it may also be applied on vertical surfaces.

Due to its exceptional tensile and tear strength and crack bridging capacity (even at low temperatures) **Purtop 1000** forms a continuous waterproof layer which adapts to any shape of substrate without cracking.

RECOMMENDATIONS

- Do not apply **Purtop 1000** to substrates polluted with oil, grease or dirt in general.
- Do not apply **Purtop 1000** on substrates which have not been thoroughly cleaned and primed.
- Do not apply **Purtop 1000** on substrates subject to rising damp.
- A primer for damp substrates must be used whenever the level of residual humidity in the substrate is higher than 4%, such as **Triblock P**.
- Do not dilute **Purtop 1000** with water or solvents.

APPLICATION PROCEDURE

Preparation of the substrate

Surfaces must be prepared accordingly depending on the type of substrate, for example by sand-blasting, shot-blasting, scarifying, bush-hammering or other methods. The substrate must then be treated with a suitable primer as described below.

1. Application on concrete substrates and cementitious screeds

Prepare the surface by sanding or shot-blasting to remove all traces of oil, grease, dirt and any other material or substances which could compromise the bond of the waterproofing system. The compressive strength and pull-off strength of the surface must be ≥ 25 MPa and ≥ 1.5 MPa respectively.

Remove all dust and any crumbling or detached parts from the substrate to leave a dry, porous, slightly rough surface with no contaminants.

Repair any hollows, cavities and detached parts in the substrate with suitable products from the **Mapegrout** and **Planitop** ranges. Choose the most suitable product according to the thickness to be repaired, the time available and the operating conditions on site.

After preparing the surface as described above, apply a coat of **Primer SN** (two-component epoxy primer with fillers), with a smooth spatula or rake and sprinkle the surface with **Quartz 0.5** or, as an alternative, of **Primer FT** (two-component ultra-rapid polyurea primer), to be applied in two coats.

If the level of humidity in the substrate is higher than 4% and it is not possible to wait until it drops to a lower value, apply two or more coats of **Triblock P** three-component epoxy-cementitious primer according to the condition of the substrate, until the system is completely sealed.

When the primer has cured sufficiently apply a coat of epoxy primer (such as **Primer SN** or **Mapecoat I 600 W**); contact MAPEI Technical Services Department for further details.

2. Application on bituminous membranes

Clean the bitumen membrane to remove all traces of oil, grease, dirt in general and any other substances or material which could affect adhesion of the following coat of primer. Remove all dust with a vacuum cleaner or

compressed air. The membrane must be perfectly dry before inspecting the surface and any damage in the membrane, such as blistering, tears or detached areas, must be repaired before applying the primer. Apply **Primer R30**, one-component solvent-based polyurethane primer or alternatively two-component epoxy primer in water dispersion **Mapecoat I 600 W**, diluted at a 1:1 ratio with water.

3. Application on metal surfaces

In case of metal surfaces or if there are any metallic elements, apply **Primer EP Rustop** two-component epoxy primer with a brush, roller or by airless spray after cleaning and treating them accordingly. As an alternative, **Mapecoat Guard 155**, adhesion promoter for polyurethane systems can be applied.

4. Application on wooden substrates and OSB panels

Clean the substrate to remove all traces of dust, dirt and other deposits. Calculate the width and pitch of the joints between the panels in order to select the most suitable product to treat these joints. Apply a coat of **Primer SN** two-component epoxy primer with fillers on the clean, dry substrate and sprinkle the surface with **Quartz 0.5**.

For any other type of substrate, contact MAPEI Technical Services Department to define the most suitable preparation treatment.

Application of the membrane

Purtop 1000 must be applied at a temperature between +5°C and +40°C.

Before applying **Purtop 1000**, remove all dust from the surface with an industrial vacuum cleaner. The temperature of the substrate must be at least 3°C higher than the dew-point temperature, while the level of residual humidity must be no higher than 4%.

Component A must be mixed carefully before use until it has an even colour.

To apply **Purtop 1000** membrane, use a high-pressure bi-mixer pump with flow and temperature control, with a self-cleaning gun.

The application temperature of the two components must be between +65°C and +85°C and the pressure must be between 160 and 200 bar.

Purtop 1000 must be applied continuously on all the horizontal and vertical surfaces.

If application of **Purtop 1000** is interrupted and then taken up again after the maximum covering time (2 hours), an overlap of at least 30 cm must be made after applying a coat of **Primer R30**.

Please note that although **Purtop 1000** is suitable for surfaces that are completely immersed and is resistant to numerous chemical agents, nonetheless we recommend that the compatibility of the membrane and the substances it will come into contact with is always checked beforehand.

Finishing off the membrane

Purtop 1000 gradually turns yellow if exposed to UV rays.

If the membrane is exposed to UV rays, apply **Mapecoat PU 20 N** two-component, aliphatic polyurethane finish to guarantee durability, with a roller or by spray.

This finish must be applied to a clean, dry surface immediately and in any case no later than 24 hours after laying the Purtop 1000 waterproofing membrane.

If **Purtop 1000** is to be covered by asphalt flooring, apply a coat of **Purtop Primer Black** one-component solvent-based primer over the clean, dry membrane with a roller or airless spray beforehand. Dust the surface of the primer with **Quartz 1.2** while it is still fresh.

Lastly, before applying the asphalt, spread at least 1 kg/m² of hot bonding layer made from modified bitumen.

When **Purtop 1000** is used in swimming pools or ornamental ponds, the following finishing cycle must be applied. Within 24 hours from the application of **Purtop 1000**, apply a coat of **Primer R30**. When the primer is dry to the touch apply **Mapecoat PU 20 N** two-component, aliphatic polyurethane finish.

Please note that the compatibility between the finish and substances it will become in contact with must be always checked beforehand in case it will be in continuous immersion.

For further information, please refer to the Technical Data Sheets of these products.

CLEANING

Because of the high bond strength of **Purtop 1000**, we recommend cleaning solvent naphtha before it starts to set. Once hardened, cleaning must be carried out only mechanically.

CONSUMPTION

Consumption of **Purtop 1000** depends on the roughness of the substrate. The theoretical consumption for a smooth surface with a substrate temperature between +15°C and +25°C is 2.2 kg/m² every 2.0 mm of thickness.

If the substrate is rougher, consumption increases. If the substrate is damaged, we recommend applying a suitable repairing product beforehand

PACKAGING

Purtop 1000 is supplied in metal drums.

Component A: 220 kg drums.

Component B: 225 kg drums.

STORAGE

When stored in its original packaging, in a dry, covered area, at a temperature between +15°C and +25°C, the shelf life of **Purtop 1000** is 12 months.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

Purtop 1000: two-component, solvent-free, pure polyurea membrane applied by spray with a high-pressure bi-mixer type pump, to form waterproofing coatings directly on site for hydraulic works, roofs and bridge decks in compliance with the requirements of EN 1504-2 coating (C) principles PI, MC, PR, RC and IR

PRODUCT IDENTITY

	component A	component B
Colour:	grey	amber yellow
Consistency:	fluid	liquid
Density:	1.08 ± 0.03 g/cm ³	1.11 ± 0.03 g/cm ³
Brookfield viscosity at +23°C:	530 ± 100 mPa·s (rotor 3 - 50 RPM)	975 ± 175 mPa·s (rotor 3 - 50 RPM)

PRODUCT APPLICATION DATA (A+B) (at +23°C - 50% R.H.)

A/B ratio (by weight):	100/103
A/B ratio (by volume):	100/100
Gel time at +23°C:	approx. 6 seconds
Surrounding temperature:	from +5°C to +40°C

PERFORMANCE ON FREE FILM (thickness 2 mm)

Mechanical characteristics after 7 days at +23°C:		
– tensile strength (ISO 37):	> 20 N/mm ²	
– elongation at failure (ISO 37):	> 300%	
– tear strength (ISO 34-1):	> 80 N/mm	
Hardness (DIN 53505):	Shore A = 90	Shore D = 45
Glass transition temperature:	-46°C	
Impermeability (EN 1928, method A)	no water penetration	

FINAL PERFORMANCE DATA (2 mm thickness)

Performance characteristic	Test method	Requirements according to EN 1504-2	Product performance
Permeability to water vapour:	EN ISO 7783-2	Class I $s_D < 5$ m Class II $5 \text{ m} \leq s_D \leq 50$ m Class III $s_D > 50$ m	Class I (average $s_D = 2.9$ m)
Capillary absorption and permeability to water:	EN 1062-3	$w < 0.1 \text{ kg/m}^2 \cdot \text{h}^{0.5}$	average $w = 0.01 \text{ kg/m}^2 \cdot \text{h}^{0.5}$
Permeability to CO ₂ :	EN 1062-6	$s_D > 50$ m	$s_D = 285$ m
Direct traction adherence test:	EN 1542	Flexible systems with no traffic: $\geq 0.8 \text{ N/mm}^2$ with traffic: $\geq 1.5 \text{ N/mm}^2$	$\geq 3 \text{ N/mm}^2$
Static crack-bridging at -10°C expressed as maximum width of cracking:	EN 1062-7	from class A1 (> 0.1 mm) to class A5 (> 2.5 mm)	Class A5 (> 2.5 mm)
Dynamic crack-bridging at +23°C:	EN 1062-7	from class B1 to class B4.2	Class B4.2
Impact strength:	EN ISO 6272-1	No cracks or delamination after loading Class I: ≥ 4 Nm Class II: ≥ 10 Nm Class III: ≥ 20 Nm	Class III

Resistance to thermal shock (1x):	EN 13687-5	After thermal cycles a) no swelling, cracking or delamination b) average direct traction adherence test (N/mm²) Flexible systems with no traffic: ≥ 0.8 N/mm² with traffic: ≥ 1.5 N/mm²	3.6 N/mm ²
Abrasion resistance (Taber test):	EN ISO 5470-1	Loss in weight less than 3000 mg with H22 abrasive disk/1,000 cycles/1,000 g load	loss in weight < 200 mg
Exposure to artificial atmospheric agents:	EN 1062-11	After 2,000 hours of artificial inclement weather: no swelling according to EN ISO 4628-2 no cracking according to EN ISO 4628-4 no flaking according to EN ISO 4628-5 Slight colour variations, loss of brightness and crumbling may be acceptable	no swelling, cracking or flaking (colour change)

Resistance to severe chemical attack:	EN 13529	Reduction of hardness less than 50% when measured according to the Shore method (EN ISO 868), 24 hours after removing the coating material from immersion in the test liquid Class I: 3 days with no pressure Class II: 28 days with no pressure Class III: 28 days with pressure	NaCl 20%: class II CH ₃ COOH 10%: class II H ₂ SO ₄ 20%: class II KOH 20%: class II CH ₃ OH: class I mixture (60% toluene, 30% xylene, 10% methylnaphthalene): class I
Reaction to fire:	EN 13501-1	Euroclass Fire reaction class for floorings	E D _{FL-S1}

OTHER PERFORMANCE CHARACTERISTICS

Resistance to root penetration (CEN/TS 14416):	no penetration or perforation
Resistance to root penetration (EN 13948):	no penetration or perforation
Suitable for contact with drinking water (DM 174/04):	global migration rate at +40°C = 11 mg/kg
Electrical resistance (EN 61340-1):	> 200 GΩ
Exposure to ozone (168h, 220 pphm, +40°C, 65% R.H.) (EN 1844):	no visible flakes at 7x

Performance characteristic	Test method	Product performance
Watertightness:	EN 1928 (60 kPa)	no water passage
Static puncture:	EN 12730 method B	pass (200 N)
Dynamic crack bridging at 0°C:	EN 1062-7	class B4.2
Slip resistance (with Mapecoat PU 20 N mixed with Mapecoat Filler or broadcast with Quartz 0.5):	EN 13036-4	Class III
Durability after UV exposure (400 MJ/m², 2460 hours) spray (492 hours) (EN ISO 4892-3 cycle 3): - Compliance criteria - Watertightness	EN ISO 4628-2 EN 1928 (60 kPa)	no blistering, no cracking, no flaking change in colour, no water passage
Resistance to ageing from heat 7 days at 70 ± 3°C (point 4.1 of EN 1062-11): - Watertightness	EN 1928 (60 kPa)	no water passage

Durability after freeze/thaw cycles without de-icing salts 20x (EN 13687-3):
- Bond strength by pull-off

EN 1542

$\geq 1 \text{ N/mm}^2$

TYPE OF PRIMER ACCORDING TO TYPE OF SUBSTRATE

SUBSTRATE	PRIMER	CONSUMPTION (g/m ²)	MIN-MAX COVERING TIMES (estimated values)
Concrete	Primer SN surface-dusted with Quartz 0.5	300-600	12-24 hours
	Triblock P	600-1200	2-7 days
Metals	Primer EP Rustop	approx. 200	6-24 hours
	Mapecoat Guard 155	approx. 100	1-3 hours
Wood and OSB panels	Primer SN surface-dusted with Quartz 0.5	300-600	12-24 hours
Bituminous membranes	Primer R30	approx. 100	1-2 hours
	Mapecoat I 600 W (diluted 1:1 with water)	approx. 150	2-4 hours
Purtop 1000	no primer	-	30 mins.-2 hours
	Primer R30	approx. 50	1-2 hours

Note: covering times refer to temperatures of between +15°C and +25°C and the consumption may vary according to the roughness of the substrate.

CHEMICAL RESISTANCE OF PURTOP 1000

CHEMICAL PRODUCTS	CONCENTRATION %	USE	
		PERMANENTLY	SPORADICALLY
Water		+	+
2, 2, 4 Trimethylpentane		(+)	+
Ethyl acetate		-	(+)
Acetone		-	(+)
Acetic acid	10	-	(+)
Citric acid	10	(+)	+
Hydrochloric acid	10	(+)	+
Phosphoric acid	50	-	+
Lactic acid	10	(+)	+
Sulphuric acid	10	+	+
Stearic acid	50	+	+
Hydrogen peroxide	5,1	-	+
Ethyl alcohol	99	-	(+)
Isopropyl alcohol		-	(+)

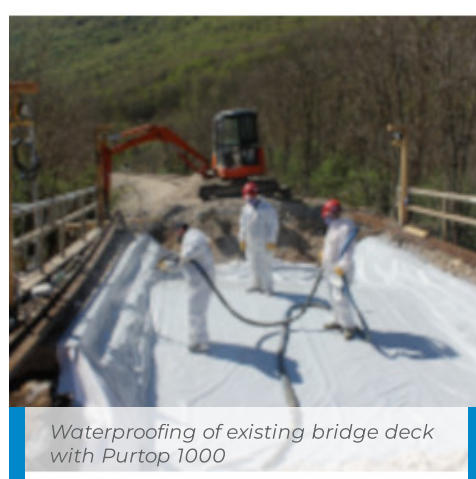
Petrol		-	(+)
Bleach		-	+
Sodium carbonate	20	+	+
Sodium chloride	10	+	+
Heptane		-	+
Hexane		-	+
Fertilizer		+	+
Diesel fuel		+	+
H ₂ O/sugar		+	+
H ₂ O/ acetum 95/5		+	+
Ammonium hydroxide	30	+	+
Brake fluid		-	-
Methanol		-	(+)
Butanone		-	(+)
NaOH	40	+	+
Olive oil		+	+
Propylene carbonate		-	-
Solid bicarbonate of soda		+	+
Sodium triphosphate		+	+
Anionic surfactant		+	+
Toluene		-	(+)
Xylene		-	(+)
+ Excellent resistance (+) good resistance - poor resistance			



Waterproof coating on a dam



Application of Purtop 1000 onto industrial storage tanks



Waterproofing of existing bridge deck with Purtop 1000

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

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