

ONE COMPONENT ALIPHATIC POLYURETHANE COATING



PRODUCT DESCRIPTION

The MARISEAL® 400 is a pigmented, color- and UV-stable, highly permanent elastic, cold applied and cold curing, one component aliphatic polyurethane coating, used as a top-coat for protection over exposed, polyurethane waterproofing coatings. Cures by reaction with ground and air moisture over a unique moisture triggered chemical reaction. Protects very efficiently, especially if a dark final color is desired.

USES

- Waterproofing of Roofs
- Waterproofing of Balconies, Terraces and Verandas
- Waterproofing of Pedestrian Decks and Walkways
- Protection of Polyurethane Foam Insulation

Used over the MARISEAL® 250 and 260 on surfaces, with domestic pedestrian traffic (e.g. Roofs, Terraces, Residential Walkways) that require a glossy, color-stable and non-chalking finish.

COLORS

The MARISEAL® 400 is supplied in white, light grey and red. Other RAL colors may be supplied on demand.

ADVANTAGES

- Simple application (roller or airless spray).
- One component.
- Increases the abrasion and wear resistance of the waterproofing membrane underneath.
- UV and Color stable.
- Gives a glossy and easy-to-clean surface.
- Does not show the chalking effect of aromatic polyurethane coatings.
- Resistant to water, heat and frost.
- Maintains its mechanical properties over a temperature span of -40°C to +90°C.
- The waterproofed surface can be walked on (domestic pedestrian traffic).

CONSUMPTION

120-250 gr/m² in one or two layers. This coverage is based on practical application by roller onto a smooth surface in optimum conditions. Factors like surface porosity, temperature, humidity, application method and finish required can alter consumption.



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TECHNICAL DATA *

PROPERTY	RESULTS	TEST METHOD
Composition	Pigmented Aliphatic moisture triggered Polyurethane polymer. Solvent based	
Resistance to Water Pressure	No Leak	DIN EN 1928
Elongation at break	289%	DIN EN ISO 527
Tensile strength	3,72 N/mm ²	DIN EN ISO 527
Elongation at break after 2000h of accelerated aging (DIN EN ISO 4892-3, 400 MJ/m ²)	372 %	DIN EN ISO 527
Tensile strength after 2000h of accelerated aging (DIN EN ISO 4892-3, 400 MJ/m ²)	2,68 N/mm ²	DIN EN ISO 527
Gloss retention after 2000h of accelerated aging (DIN EN ISO 4892-3, 400 MJ/m ²)	Good	DIN 67530
Surface chalking after 2000h of accelerated aging (DIN EN ISO 4892-3, 400 MJ/m ²)	No chalking observed. Chalking grade 0	DIN EN ISO 4628-6
Adhesion to the MARISEAL® 250	>2 N/mm ²	ASTM D 903
Hardness (Shore A Scale)	65	ASTM D 2240 (15")
Solar Reflectance (SR) (white color)	93.5%	ASTM E903-96
UV accelerated ageing, in the presence of moisture	Passed - No significant changes	EOTA TR-010
Hydrolysis (5% KOH, 7days cycle)	No significant elastomeric change	Inhouse Lab
Service Temperature	-40°C to +90°C	Inhouse Lab
Tack Free Time	1-3 hours	Conditions: 20°C, 50% RH
Light Pedestrian Traffic Time	12 hours	
Final Curing time	7 days	
Chemical Properties	Good resistance against acidic and alkali solutions (5%), detergents, seawater and oils.	

APPLICATION

Surface Preparation

Careful surface preparation is essential for optimum finish and durability. The surface needs to be clean, dry and sound, free of any contamination, which may harmfully affect the adhesion of the membrane. Maximum moisture content should not exceed 5%. Substrate compressive strength should be at least 25MPa, cohesive bond strength at least 1.5MPa. New concrete structures need to dry for at least 28 days. Old, loose coatings, dirt, fats, oils, organic substances and dust need to be removed by a grinding machine. Possible surface irregularities need to be smoothed. Any loose surface pieces and grinding dust need to be thoroughly removed.

WARNING: Do not wash surface with water!

Waterproofing Membrane

See relevant MARIS POLYMERS product Technical Data Sheet

Top-Coat

Stir MARISEAL 400 well before using.

Apply the MARISEAL® 400 by roller or airless spray in one or two layers.

Allow 3-6 hours (not more than 36 hours) to cure, between the two layers.

For best results, the temperature during application and cure should be between 5oC and 35OC. Low temperatures retard cure while high temperature speed up curing. High humidity may affect the final finish.

WARNING: The MARISEAL® 400 is slippery when wet. In order to avoid slipperiness during wet days, sprinkle suitable aggregates onto the still wet coating to create an anti-slip surface. Please contact our R+D Dept. for more details.

WARNING: If on the surface where the MARISEAL® system is applied, there are areas with ponding water, they should be cleaned on regular basis to avoid biological and microbial attack.

PACKAGING

MARISEAL® 400 is supplied in 20 kg, 10 kg and 5 kg metal pails. Pails should be stored in dry and cool rooms for up to 9 months. Protect the material against moisture and direct sunlight. Storage temperature: 50-300C. Products should remain in their original, unopened containers, bearing the manufacturers name, product designation, batch number and application precaution labels.

SAFETY MEASURES

MARISEAL® 400 contains isocyanates. See information supplied by the manufacturer. Please study the Safety Data sheet. PROFESSIONAL USE ONLY

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The MARISEAL® 250 was additionally tested and approved according:

- DIN 1928, which classifies it as a waterproofing coating.
- DIN 4102 part I, which classifies it as a B2 fire rating construction material.
- DIN 4102 part 7, which classifies it as a surface coating resistant to flying sparks and radiating heat.

The MARISEAL® 250 has also been tested and certified in many countries around the world according to local and national regulations and norms.

PRODUCT DESCRIPTION

MARISEAL® 250 is a premium, liquid-applied, highly permanent elastic, cold applied and cold curing, one component polyurethane membrane used for long lasting waterproofing.

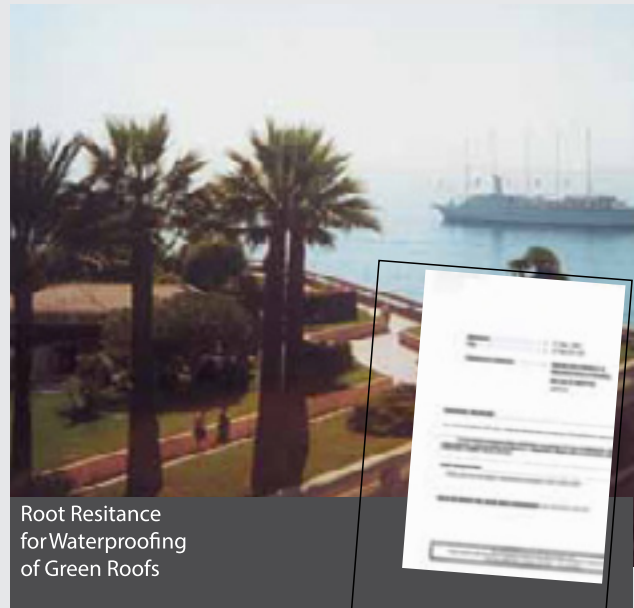
The MARISEAL® 250 is based on pure elastomeric hydrophobic polyurethane resins, which result in excellent mechanical, chemical, thermal, UV and natural element resistance properties.

Cures by reaction with ground and air moisture.



USES

- Waterproofing of Roofs
- Waterproofing of Balconies, Terraces and Verandas
- Waterproofing of Wet Areas (under-tile) in Bathrooms, Kitchens, Balconies, Auxiliary Rooms, etc
- Waterproofing of Pedestrian and Vehicular traffic Decks
- Waterproofing of Green Roofs, Flowerbeds, Planter Boxes
- Waterproofing of old Bitumen felts, Asphalt felts, EPDM and PVC membranes and old Acrylic coatings.
- Protection of Polyurethane Foam Insulation
- Waterproofing and protection of Concrete constructions like Bridge-Decks, Tunnels, Stadium Stands, Car Parks, etc.



The MARISEAL® 250 was tested according EN 53420 which classifies it as a root-resistant coating, suitable to be used in green roofs, flowerbeds and planters.

CERTIFICATIONS

The MARISEAL® 250 was tested by the German state testing institute for construction materials MPA-Braunschweig according the European Union Directive for liquid-applied roof waterproofing kits ETAG 005 and was found conforming.

The MARISEAL® 250 was certified by the German state Institute for construction techniques DIBt-Berlin with the European Technical Approval (ETA) and with the CE-mark and certification according to the EOTA (European Organization of Technical Approval).

The MARISEAL® 250 was also tested and approved by various laboratories in different countries around the world.



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ADVANTAGES

- Simple application (roller or airless spray).
- When applied forms seamless membrane without joints.
- Resistant to water.
- Resistant to frost.
- Resistant to root penetration, so it can be used in green roofs.
- Crack-bridging up to 2mm, even at -10°C.
- Provides water vapor permeability, so the surface can breathe.
- Provides excellent thermal resistance, it never turns soft.
- Provides excellent weather and UV resistance.
- Waterproofs old bitumen-, asphalt felts by covering them, without the need to remove them prior to application.
- Provides high sun reflectivity, contributing to thermoinsulation.
- Maintains its mechanical properties over a temperature span of -40°C to +90°C.
- Provides excellent adhesion to almost any type of surface.
- The waterproofed surface can be used for domestic and public pedestrian and vehicular traffic.



- Resistant to detergents, oils, seawater and domestic chemicals.
- Even if the membrane gets mechanically damaged, it can be easily repaired locally within minutes.
- Does not need the use of open flames (torch) during application.
- Over 15 years of positive feedback worldwide.

TECHNICAL DATA

PROPERTY	RESULTS	TEST METHOD
Elongation at Break	> 800 %	ASTM D 412 / DIN 52455
Tensile Strength	> 4 N/ mm ²	ASTM D 412 / DIN 52455
Water Vapor Permeability	> 25 gr/m ² /day	ISO 9932:91
Resistance to mechanical damage by static impression	High Resistance (class:P3)	EOTA TR-007
Resistance to mechanical damage by dynamic impression	High Resistance (class:P3)	EOTA TR-006
Resistance to Water Pressure	No Leak (1m water column, 24h)	DIN EN 1928
Adhesion to concrete	>2,0 N/mm ² (concrete surface failure)	ASTM D 903
Crack Bridging Capability	up to 2 mm crack	EOTA TR-008
Hardness (Shore A Scale)	65	ASTM D 2240 (15")
Resistance to Root Penetration	Resistant	UNE 53420
Solar Reflectance (SR)	0.87	ASTM E903-96
Solar Emittance (ε)	0.89	ASTM E408-71
Thermal Resistance (80°C for 100 days)	Passed - No significant changes	EOTA TR-011
UV accelerated ageing, in the presence of moisture	Passed - No significant changes	EOTA TR-010
Resistance after water aging	Passed	EOTA TR-012
Hydrolysis (5% KOH, 7days cycle)	No significant elastomeric change	Inhouse Lab
Construction Material Fire class	B2	DIN 4102-1
Resistance to Flying Sparks and Radiating Heat	Passed	DIN 4102-7
Service Temperature	-30°C to +90°C	Inhouse Lab
Shock Temperature (20min)	200°C	Inhouse Lab
Rain Stability Time	4 hours	Conditions: 20°C, 50% RH
Light Pedestrian Traffic Time	12 hours	
Final Curing time	7 days	
Chemical Properties	Good resistance against acidic and alkali solutions (5%), detergents, seawater and oils.	

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APPLICATION

Surface Preparation

Careful surface preparation is essential for optimum finish and durability.

The surface needs to be clean, dry and sound, free of any contamination, which may harmfully affect the adhesion of the membrane. Maximum moisture content should not exceed 5%. Substrate compressive strength should be at least 25MPa, cohesive bond strength at least 1.5MPa. New concrete structures need to dry for at least 28 days.

Old, loose coatings, dirt, fats, oils, organic substances and dust need to be removed by a grinding machine. Possible surface irregularities need to be smoothed. Any loose surface pieces and grinding dust need to be thoroughly removed. **WARNING:** Do not wash surface with water!

Repair of cracks and joints:

The careful sealing of existing cracks and joints before the application is extremely important for long lasting waterproofing results.

- Clean concrete cracks and hairline cracks, of dust, residue or other contamination. Prime locally with the MARISEAL® 710 Primer and allow 2-3 hours to dry. Fill all prepared cracks with MARIFLEX® PU 30 sealant. Then apply a layer of MARISEAL® 250, 200mm wide centered over all cracks and while wet, cover with a correct cut stripe of the MARISEAL® Fabric. Press it to soak. Then saturate the MARISEAL® Fabric with enough MARISEAL® 250, until it is fully covered. Allow 12 hours to cure.
- Clean concrete expansion joints and control joints of dust, residue or other contamination. Widen and deepen joints (cut open) if necessary. The prepared movement joint should have a depth of 10-15 mm. The width:depth ratio of the movement joint should be at a rate of approx. 2:1. Apply some MARIFLEX® PU 30 Joint-Sealant on the bottom of the joint only. Then with a brush, apply a stripe layer of MARISEAL® 250, 200mm wide centered over and inside the joint. Place the MARISEAL® Fabric over the wet coating and with a suitable tool, press it deep inside the joint, until it is soaked and the joint is fully covered from the inside. Then fully saturate the fabric with enough MARISEAL® 250. Then place a polyethylene cord of the correct dimensions inside the joint and press it deep inside onto the saturated fabric. Fill the remaining free space of the joint with MARIFLEX® PU 30 sealant. Do not cover. Allow 12- 18 hours to cure.

Priming

Prime absorbent surfaces like concrete, cement screed or wood with MARISEAL® 710 or with MARISEAL® AQUA PRIMER. Prime surfaces like bitumen-, asphaltfelts with MARISEAL® 730 or with MARISEAL® AQUA PRIMER.

Prime non-absorbent surfaces like metal, ceramic tiles and old coatings with MARISEAL® AQUA PRIMER. Allow the primer to cure according its technical instruction.

Waterproofing membrane

Stir well before using. Pour the MARISEAL® 250 onto the primed surface and lay it out by roller or brush, until all surface is covered. You can use airless spray allowing a considerable saving of manpower.

After 12-18 hours (not later than 48 hours) apply another layer of the MARISEAL® 250.

For demanding applications, apply a third layer of the MARISEAL® 250.

Reinforce always with the MARISEAL® Fabric at problem areas, like wall-floor connections, 90o angles, chimneys, pipes, waterspouts (siphon), etc. In order to do that, apply on the still wet MARISEAL® 250 a correct cut piece of MARISEAL® Fabric, press it to soak, and saturate again with enough MARISEAL® 250. For detailed application instructions with the MARISEAL® Fabric, contact our R+D department.

RECOMMENDATION: We recommend reinforcement of the entire surface, with the MARISEAL® Fabric. Use 5-10 cm stripe overlapping.

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APPLICATION (CONT.)

ATTENTION: Do not apply the MARISEAL® 250 over 0.6 mm thickness (dry film) per layer. For best results, the temperature during application and cure should be between 5oC and 35oC. Low temperatures retard cure while high temperature speed up curing. High humidity may affect the final finish.

Finishing

If a color stable and chalking-free surface is desired, apply one or two layers of the MARISEAL® 400 Top-Coat over the MARISEAL® 250. The application of the MARISEAL® 400 Top-Coat, is especially required, if a dark final color, is desired. (e.g. red, grey, green) If a heavy duty, abrasion resistant surface is desired (e.g. Public Pedestrian Deck, Car Parking, etc), apply two layers of the MARISEAL® 420 Top-Coat.

For the several Top-Coats application procedures, please consult their technical instructions or contact our R+D Department.

WARNING: The MARISEAL® system is slippery when wet. In order to avoid slipperiness during wet days, sprinkle suitable aggregates onto the still wet coating to create an anti-slip surface. Please contact our R+D Dept. for more details.

PACKAGING

MARISEAL® 250 is supplied in 25 kg, 15 kg, 6 kg, 1kg metal pails and 250 kg Barrels. Pails should be stored in dry and cool rooms for up to 9 months. Protect the material against moisture and direct sunlight. Storage temperature: 50-300C. Products should remain in their original, unopened containers, bearing the manufacturers name, product designation, batch number and application precaution labels.

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LOCATION

