

# RHEOCRETE PROOF MARINE

## A liquid admixture for corrosion protection of concrete

### Description

RHEOCRETE PROOF MARINE is a hydrophobic pore-blocking ingredient (H.P.I.) for concrete. It provides protection and resistance to water by reducing permeability. Capillary suction is dramatically reduced, thus preventing the ingress of potentially deleterious soluble salts such as chlorides and sulphates, resulting in concrete with enhanced durability.

### Primary uses

Concrete in marine environments or exposed to de-icing salts; concrete below ground, in bridge decks, and in water retaining structures, will all benefit from extended service life and reduced maintenance by incorporating RHEOCRETE PROOF MARINE in the original concrete mix design.

Examples are:

- Reinforced concrete in marine environments subject to tidal and wet/dry cycling.
- Below ground structures, basements, piles and pile caps, foundations, service ducts, etc.
- Highway structures in contact with spray or from directly applied de-icing salts.
- Water retaining structures, water tanks, swimming pools, reservoirs, water towers.
- Waste water treatment and desalination plants.
- Land drainage, manholes, silage pits.
- Encapsulation of toxic waste.

### Advantages

#### Integral:

- Completed in one operation.
- Unaffected by surface impact or abrasion.
- Can be used in concrete in contact with potable water.

#### Cost effective through:

- Simplified design.
- No membrane required.
- Reduced excavation costs.
- No protective blockwork needed.
- Faster construction time.
- Insensitive to delays caused by inclement weather.

- Drilled fixings can be made without loss of performance.

#### Corrosion protection:

- Integral protection against soluble salts.
- The need for a protective coating is reduced.
- May be used for concrete in contaminated ground.
- Improved chemical resistance.
- Cost effective.
- It should be noted that the cementitious nature of concrete containing RHEOCRETE PROOF MARINE can in certain circumstances still be subject to attack by acids.

#### Packaging

RHEOCRETE PROOF MARINE is supplied in 180 and 900 litre units.

#### Typical properties\*

Appearance:	Dark brown liquid
Specific gravity:	0.95 – 1.03 at 25°C
Air entrainment:	1-2%
Chloride content:	Nil to BS 5075 : 1982
Nitrate content:	<0.1%(w/w admixture)
Alkali content as Na <sub>2</sub> O:	<0.1%(w/w admixture)
Freezing point:	0°C
Flash point:	Not applicable

#### Performance compared with control concrete

Test	RHEOCRETE PROOF MARINE	% reduction over control
Water Absorption (BS 1881 Part 122)	<1%	63 - 68%
Chloride Permeability Coulombs (AASHTO T277)	<400 at 7 months	75%
Chloride Diffusion	$2.67 \times 10^{-9} \text{ cm}^2/\text{sec}$	75%
Surface Absorption	0.003 mls/m <sup>2</sup> /sec	83 - 86%
Chloride Equilibrium	$3.08 \times 10^{-3} \text{ mol/day}$	75%



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Control concrete 350kg/m<sup>3</sup>, cement content - free w/c ratio 0.45, containing same addition of superplasticiser.

## Standards

BS 1881 Part 5 (ISAT) Part 122 and 124  
AASHTO T277-83

Water Research Council approval reference 9208512 Waterproofers and 9208513 Permeability Reducers as a material which has passed full tests for effect on water quality.

## Guide to application

### Mix design:

Concrete shall be designed in accordance with BS 5838 Part 1 : 1980.

The minimum cement content shall be 350kg/m<sup>3</sup> and the maximum free water cement ratio shall be 0.38. RHEOCRETE PROOF MARINE shall be added at the rate 20 to 30 litres per cubic metre of concrete. Due allowance shall be made for the free water in RHEOCRETE PROOF MARINE when calculating water cement ratios.

When designing for specific mechanical properties RHEOCRETE PROOF MARINE shall be incorporated from the outset. It is strongly recommended that trial mixes are carried out to determine the properties of concrete containing RHEOCRETE PROOF MARINE prior to work on site.

To achieve the necessary workability at the specified water cement ratio it is necessary to incorporate a superplasticiser from the RHEOBUILD range of admixtures. The choice of admixture and addition rate will depend on the mix design and constituent materials.

### Addition:

RHEOCRETE PROOF MARINE should be added to a concrete mix by means of an appropriate admixture dispensing unit. The plasticising or, in hot climates, retarding admixture should be similarly added after the addition of the RHEOCRETE PROOF MARINE. Normally the RHEOCRETE PROOF MARINE is added first to the mixer drum with approximately one third of the total mixing water. Subsequently, the mix ingredients are added with the remaining water and the plasticiser/retarder. Mixing should be thorough

and for a minimum of two minutes, or until the mix is uniform. Never add admixtures to dry cement.

## Watchpoints

Trials must be carried out to ensure mix design meets specified performance criteria.

Agitate the drum before use. Some slight settlement may take place particularly in cold weather.

## Curing

Concrete incorporating RHEOCRETE PROOF MARINE should be cured according to normal good practice. For concrete below ground MASTERKURE 161, a bituminous based protective curing compound, is recommended. Backfilling operations can begin immediately when the MASTERKURE 161 is dry to the touch, normally within 1-2 hours.

For above ground an appropriate MASTERKURE product is recommended.

## Effects of over dosage

A severe over dosage of RHEOCRETE PROOF MARINE will result in the following:

- Increased workability and retardation of set.
- Increased air entrainment.
- Lower initial compressive strengths.

## Compatibility

RHEOCRETE PROOF MARINE is compatible with all types of Portland Cement including sulphate resisting and cement blends. RHEOCRETE PROOF MARINE should not be premixed with other admixtures.

## Joints

All joints and openings through the watertight concrete need proper sealing. Other important detailing such as cover to reinforcement should be as normal for the type of structure and conditions applying.

## Storage

Store under cover, out of direct sunlight and protect from extremes of temperature. Protect from frost. Shelf life is one year when stored as recommended in unopened containers.

## Safety precautions

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs (which can also be tainted



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with vapour until product is fully cured or dried). Treat splashes to skin and eyes immediately. If accidentally ingested, seek medical attention. Reseal containers after use. For specific storage and disposal instructions refer to the Material Safety Data Sheet.

## Note

Field service, where provided, does not constitute supervisory responsibility. For additional information contact your local BASF representative.

BASF reserves the right to have the true cause of any difficulty determined by accepted test methods.

## Quality and care

All products originating from BASF's Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001, ISO 14001 and OHSAS 18001.

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