

Marine Mortar S

Class R4 Structural Repair Mortar for Marine and Tidal Areas



Product Overview

Thixotropic, fibre reinforced, cementitious mortar for the structural repair and reinstatement of concrete in marine and tidal areas. CE-marked in accordance with BS EN 1504-3 Class R4.

Uses

Structural repair and profiling of vertical, horizontal and overhead surfaces in marine and tidal areas which are subject to early immersion. Suitable for repair methods 3.1, 3.2, 7.1, 7.2 as defined by BS EN 1504-3.

Advantages

- Incorporates the latest proven cement chemistry, microsilica, fibre and styrene acrylic copolymer technology.
- Pre-packaged material that only requires simple mixing.
- Thixotropic mortar which allows easy trowel application whilst enabling high application thicknesses up to 50mm per layer in both vertical and horizontal applications.
- Excellent resistance to wash-out soon after application.
- Low shrinkage and high bond strength ensure monolithic performance of the repair.
- Fibre reinforced to improve tensile and impact strength.
- Dense matrix provides excellent protection against the ingress of acid gases, moisture and chlorides. Improved tensile and impact strength. Excellent low sag properties.
- Non-toxic when cured.
- Economic mortar generally requiring no substrate or inter-layer priming.

Description

MARINE MORTAR S is a fibre reinforced, polymer modified, cementitious mortar with excellent adhesion for use in areas subject to early immersion. It cures rapidly to produce a high strength mortar with enhanced polymeric properties for the repair of voids in aggressive marine environments. It is supplied as a two-component system ready for on-site mixing and use, requiring no extra addition of water or aggregate and is suitable for thicknesses up to 50mm.

Compliance

- CE-marked in accordance with BS EN 1504-3 Class R4. Suitable for repair methods 3.1, 3.2, 7.1, 7.2 as defined by BS EN 1504-3.
- BBA Approved, Certificate No. 05/4276.
- Compliant with Highways Agency Standard BD27/86 for the repair of Highway Structures.

Specification Clause

The repair mortar shall be a thixotropic, fibre reinforced, polymer modified, cementitious mortar, and shall be CE-Marked in accordance with BS EN 1504-3 Class R4. It shall be BBA Certified and comply with the following performance specification:

- Compressive strength at 20°C of at least 15-20 MPa in 1 day and 50-60 MPa in 28 days.
- Free plastic shrinkage of no more than 0.02% at 28 days.
- Bond strength of 33-36 MPa in accordance with BS 6319 - Part 4 Slant Shear Method.
- Impermeable to water under 10 bar hydrostatic pressure such that 10mm of mortar is equivalent to 3000mm of concrete.



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EN1504-3: Concrete repair product for structural repair
 PCC mortar (based on hydraulic cement polymer modified)

Compressive Strength	: Class R4 ≥ 45 MPa
Adhesive Bond	: Class R4 ≥ 2.0 MPa
Chloride Ion Content	: ≤ 0.05%
Carbonation Resistance	: Passes
Elastic Modulus	: 26 GPa
Thermal Capability Part 1	: Class R4 ≥ 2.0 MPa
Capillary Absorption	: 0.056 kg.m ⁻² .h ^{0.5}
Dangerous Substances	: Complies with 5.4
Reaction to Fire	: Class F



Technical Data / Mechanical Characteristics

Property	Standard	BS EN 1504-3 Class R4 Requirement	Result
Compressive Strength	EN 12190	≥ 45 MPa	28 days: 52 MPa
Compressive Strength Development	BS4551		5°C 1 day 5-10 MPa 28 days 40-50 MPa 20°C 15-20 MPa 50-60 MPa
Adhesive Bond	EN 1542	≥ 2.00 MPa (Class R4)	2.20 MPa
Chloride Ion Content	EN 1015-17	≤ 0.05%	0.016%
Carbonation Resistance	EN 13295	≤ ref concrete	Passes
Elastic Modulus	EN 13412	≥ 20 GPa	26 GPa
Capillary Absorption	EN 13057	≤ 0.5 kg/m ² .h ⁰⁵	0.056 kg/m ² .h ⁰⁵
Thermal Compatibility Freeze/Thaw Cycling	EN 13687-1	≥ 2.0 MPa	2.28 MPa
Water Permeability Coefficient Equivalent Concrete Thickness	Vinci Test		6.21 x 10 ⁻¹⁶ 10mm of Marine Mortar S = 3000mm of concrete
Flexural Strength	EN196-1		11.0MPa
Tensile Strength	BS 6319-7		4.02 MPa
Mixed Density			2150 kg/m ³
Mixed Colour			Concrete grey
Min Application Thickness Max Application Thickness			5mm 50mm per layer
Min Application Temperature Max Application Temperature			5°C 35°C
Working Life (approx.)			60 minutes at 20°C
Reaction to Fire	EN13501-1	Euroclass	Euroclass F

The properties given above are obtained from laboratory tests: results obtained from on-site testing may vary according to site conditions.

Application Instructions

Preparation

Mechanically remove all damaged concrete back to a sound core. Wherever possible, the full circumference of the steel reinforcement should be exposed to at least 25mm behind the bars and 50mm beyond the point at which corrosion is visible.

On cutting back, feather edges must be avoided. The perimeter of the repair area should be stepped to a depth of 10mm by means of saw, disc cutting or preferably using a power chisel.

The areas to be repaired must be free from all unsound material, dust, oil, grease, corrosion by-products and organic growth.

Smooth surfaces should be roughened, all loose material and surface laitance removed and reinforcement cleaned to bright steel using wet grit blasting techniques or equivalent approved methods.

The strength of the concrete sub-base should be a minimum of 20MPa.

The prepared substrate should be thoroughly soaked with clean water until uniformly saturated without any standing water.

Treatment of Steel Reinforcement

All exposed steel reinforcement should be treated with 2 x 1mm coats of **STEEL REINFORCEMENT PROTECTOR 841** applied by brush (See separate Data Sheet for full details).

NB: When carrying out repairs in new construction, it is not necessary to fully expose any reinforcing bars.

Priming of Concrete

MARINE MORTAR S is highly polymer modified and as a result concrete surfaces do not generally require a primer. Highly porous substrates should be primed with **BONDING BRIDGE 842** prior to the application of the repair mortars (See separate Data Sheet for full details).





Mixing

MARINE MORTAR S should be mechanically mixed using a forced action pan mixer or in a clean drum using a slow speed (240 rpm) drill and paddle. A normal concrete mixer is **NOT** suitable.

Shake Part A (liquid) and pour into the mixing vessel and while mixing, slowly add Part B (powder). Mixing time depends on the type of mixer used, 2-3 minutes is average. **DO NOT ADD WATER OR OTHER MATERIALS TO THE PRODUCT.** Mix so as to entrain as little air as possible. Bottles of liquid and bags of powder **MUST NOT BE SPLIT.** Use without delay.

Please Note: It is vital to the success of the application that these instructions are strictly adhered to. Flexcrete cannot be held responsible for any product failures due to incorrect mixing.

Placing

MARINE MORTAR S should be compacted in layers not exceeding the maximum recommended thickness using a placement technique to remove entrapped air. If necessary, support with shuttering to allow for compaction if working to reveals, etc.

For repairs which require multi-layer applications, it is important to ensure that previous layers are well keyed and stable but not fully set (2-6 hours dependent on temperature) prior to the application of subsequent layers. No inter-layer priming is required. Final profiling of a high quality is easily achieved with a steel float. **ALLOW TO CURE FOR A MINIMUM OF 1 HOUR BEFORE BEING IMMERSUED. THE AREA SHOULD BE PROTECTED FROM WAVE ACTION OR AGGRESSIVE FLOW IF NECESSARY.**

Curing

Normal concreting procedures should be strictly adhered to. It is important that the surface of the mortar is protected from strong sunlight and drying winds with **FLEXCRETE CURING MEMBRANE WB**, polythene sheeting, damp hessian or similar (See separate Data Sheet for full details).

Cleaning and Storage

All tools should be cleaned with water immediately after use.

Materials can be stored for 12 months in dry, frost free conditions with unopened bags at 20°C.

Packaging

MARINE MORTAR S is supplied in 30kg composite packs.

Yield and Coverage

14 litres per 30kg pack.

A 30kg pack as supplied covers 0.7m² at 20mm thickness.

Limitations

Do not use **MARINE MORTAR S** when the temperature is below 5°C and falling. Do not use **MARINE MORTAR S** on waterproof concrete without referring to the Flexcrete Technical Department.

Health and Safety

Safety Data Sheets are available on request.

Application Top Tips

1. **DO NOT WET OUT OR PRIME** between layers.
2. If the mortar thickens, remix but **DO NOT ADD EXTRA WATER.**
3. **DO NOT OVER TROWEL.** If the mortar begins to slump, allow to stabilise and refinish.
4. When finishing, trowel from centre out towards the perimeter working into the edges of the repair.
5. Cold Weather Working (See separate Guide)
 - ≥3°C on a rising thermometer.
 - ≥5°C on a falling thermometer.
 - Do not use any Part A which has been frozen.
6. Hot Weather Working (See separate Guide)
 - Store material in cool conditions to maximise working life.
 - Shade applied material from strong sunlight.
 - Spray apply a second coat of **CURING MEMBRANE WB.**
 - If possible, avoid extreme temperatures by working at night.

The information herein is correct to the best of our knowledge, but it does not necessarily refer to the particular requirements of the customer. If the customer has any particular requirements it should make them known in writing to Flexcrete Technologies Limited, and obtain further advice accordingly.



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