

# BluCem HB50

## RAPID SETTING MARINE HIGH BUILD MORTAR

BluCem HB50 is a one component cement powder which requires only the addition of water to form a concrete repair cementitious mortar.

BluCem HB50 is a trowelable, highly durable product suitable for civil engineering applications. BluCem HB50 incorporates marine grade cement systems and advanced polymer additives to form a cementitious mortar which is chloride and sulphate resistant, C Class dual shrinkage compensated, potable water use approved and suitable for 100 year design life applications.

### Application Advantages

- Rapid strength gain
- High build
- Suitable for early submersion

### Lifecycle Advantages

- Chloride and sulphate resistant
- Type C Class dual shrinkage compensated
- Potable water use approved

### About the Product

BluCem HB50 is the reliable choice of repair mortar for challenging environments due to its blend of special sulphate and chloride resistant cements. The product provides fast setting times and high chemical resistance which ensures repairs can be undertaken within tidal zones and other applications requiring fast return to service. BluCem HB50 is the ultimate high performance repair mortar where engineers require a positive outcome in the most difficult application environments.

### Application Solutions

- Concrete protection
- Concrete repair
- Structural repair
- Precast concrete repairs
- Architectural repairs
- Floor repair and topping
- She-bolt hole repair
- Repairs to airport runways

### Project Specification Clause

RAPID SETTING MARINE HIGH BUILD MORTAR - The concrete repair cementitious mortar used for this project shall be a one component cement powder which requires only the addition of water to form a durable concrete repair product. It shall be a pre-blended product that has independent testing to validate the performance outlined in the technical data table on the following pages. BluCem HB50 manufactured by Bluey Technologies or equivalent shall be accepted.

### Project Examples

Airport construction, bridge repair, building repairs, dam construction and repair, factory floors, car park decks, jetty construction and repair, concrete structures, rail construction, rail repairs and shutdowns, retaining walls, road cuttings, road repairs, runway repairs and shutdowns, sea wall repair and maintenance, sewer repair and lining, tunnel lining, tunnel rock support, warehouse floors, wharf repair and construction.



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### Application Specification

#### CONCRETE PREPARATION

- I.1 All defective host substrate must be removed prior to application. Defective material includes cracked or structurally weakened surfaces and also chloride contaminated and carbonated concrete. A concrete corrosion expert must be consulted for critical projects or structural applications.
- I.2 Host concrete must be roughened and aggregate exposed to ensure good bond. Removal of laitance is important to ensuring good bond. Shot-blasting, scarification, mechanical chipping or high pressure water blasting may be used to achieve a recommended minimum CSP3 surface finish. It is important to select a preparation method which is considerate to the application environment, host concrete, and surface finish requirements. The correct balance between roughening the surface and not causing further micro-cracking and damage should be trialed and assessed using adhesion test methods following initial preparation trials.
- I.3 All surfaces must be free of dust, oils and surface contaminants. This may require steam cleaning or high pressure water blasting.
- I.4 A perimeter edge of at least 10mm depth must be provided around the area for application.
- I.5 Priming using BluCem API0 is recommended. Priming by saturation of the surface using potable water prior to application is also acceptable. Priming with epoxy primers or other products which prevent vapour transmission is not recommended.

#### STEEL PREPARATION

- 2.1 Following removal of all defective concrete, any partially exposed reinforcing bars shall be fully exposed to a depth of 20mm behind the bar.
- 2.2 If the bar has lost more than 20% of its original diameter then it should be replaced and the Structural Engineer must be consulted.
- 2.3 Where the original reinforcement is retained it must be cleaned to a standard surface purity of Sa 2.5 for chloride contaminated concrete and Sa 2.0 for carbonated concrete. This is best achieved by wet blasting or abrasive blasting.
- 2.4 If chloride contamination is present then high pressure wet blasting is the only acceptable method of cleaning. Priming of reinforcement is generally not required.
- 2.5 If the steel will be exposed to the atmosphere for several days after cleaning then an acceptable form of priming would be to mix BluCem HB50 into a slurry using BluCem API0 and apply a cement rich coating to the steel surface.

#### MIXING

- 3.1 Add BluCem HB50 to potable water in a clean vessel using a high shear mechanical mixer for at least three minutes. Do not mix more material than can be placed in 15 minutes. Add enough water to achieve the desired consistency within the water ratio limits specified in this data sheet.

#### APPLICATION

- 4.1 Work small amounts of mixed BluCem HB50 into the primed or dampened surface. Do not exceed 40mm of thickness in any wet layer.
- 4.2 Roughen the surface between each layer and wait until initial set or all latent heat has dissolved prior to application of next layer.

#### APPLICATION TEMPERATURES

- 5.1 The mix water's temperature should be kept as low as possible to prevent the grout from hydrating too rapidly.
- 5.2 As with the water temperature, the higher the air temperature the more quickly the grout hydrates and sets. Bluey Technologies specify mixing times and set times at an ambient temperature of 20°C. These times vary with temperature fluctuations, and adjustments will be required to compensate for this. Exposing the pumping hoses to the sun on a hot day accelerates the product's set time. In some cases it may be necessary to cool the material, the mix water, or even the hose itself during the process and pre-planning the storage of all materials to keep the temperature as low as possible.
- 5.3 High-shear mixing can add 1 to 2°C per minute of mixing. In order to minimise this effect, add all ingredients to the mixer as quickly as possible and minimise prolonged batch-mixing procedures.
- 5.4 It is estimated that every 10°C increase in temperature will halve the product set time. Likewise every 10°C reduction will double the set time. These set time variances may have detrimental consequences for the final set product and Bluey Technologies should be consulted where extreme temperatures are anticipated.

#### CURING

- 6.1 It is recommended that the final surface finish layer is coated with curing compound or otherwise maintained wet for at least three days.

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### Product Data

Please refer to Important Notice on following page

Packaging	20kg bags
Water Addition	Trowel: 3.0 - 3.5 litres per 20kg bag Pour: 3.5 - 4.0 litres per 20kg bag
Yield	12.8 litres per 20kg @ 15% water
Application Thickness	Refer to Bluey Technologies for advice and approval on pour thicknesses with dimensions exceeding 100mm
Pot Life	15 minutes @ 20°C Pot life is temperature dependant. An increase in grout temperature by 10°C will halve pot life. Bluey Technologies recommends preconditioning powder and water to around 20°C for best results
Maximum Particle Size	0.3mm

TESTED CHARACTERISTIC	STANDARD	RESULT
Portland Cement	AS3972	Complies
Aggregates	AS2758.0	Complies
Compressive Strength	AS1478.2	3.0 litres water per 20kg Trowellable 30MPa @ 4 hours 40MPa @ 24 hours 45MPa @ 7 days 50MPa @ 28 days
Coefficient of Thermal Expansion	EN13295	15µstrain/°C
Chloride Ion Content	AS1012.20	<0.01%
Sulphate Resistance	AS2350.14	<50µstrain @ 16 weeks
Chloride Diffusion	Nordtest NT Build 443	4.42 x 10 <sup>-12</sup> m <sup>2</sup> /second
Chloride Ion Penetrability	ASTM C1202	Low
Elastic Modulus	AS1012.17	25GPa @ 28 days
Tensile Strength	AS1012.10	3MPa @ 28days
Drying Shrinkage	AS1478.2	190µstrain @ 7 days 400µstrain @ 28 days
Flexural Strength	ASTM C348	6.5MPa @ 28 days
Indirect Tensile Strength	AS1012.18	3.3MPa @ 28 days
Bond Strength to Primed Substrate*	AS1012.24	Minimum 0.75MPa
Setting Time	AS1012.18	Initial set - 30 minutes Final set - 45 minutes
Fresh Wet Density		1880kg/m <sup>3</sup>

\* Bond strength at 7 days; subject to adequate surface preparation

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### IMPORTANT NOTICE

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