



# BluCem HB55

## SPRAYABLE SHOTCRETE

BluCem HB55 is a one component cement powder which requires only the addition of water to form a concrete repair cementitious mortar.

BluCem HB55 is a sprayable, high build product suitable for civil engineering applications. BluCem HB55 incorporates specially graded aggregates and advanced cement additives to form a cementitious mortar with low drying shrinkage, ultra low chloride permeability, high alkalinity, low electrical resistance and high strength.

### Application Advantages

- Ultra high build in one pass
- Negligible rebound
- Fast application
- Minimal dust emission
- Easy dry spraying

### Lifecycle Advantages

- Low drying shrinkage
- High alkalinity
- Low electrical resistance
- High strength and high adhesion

### About the Product

BluCem HB55 had been developed using a blend of carefully selected aggregates combined with OPC Cement to form the basis of this very dense, high build repair mortar. The selected aggregates are custom graded by Bluey Technologies to create maximum interlocking during dry spraying to build depths of several hundred millimetres in one pass, creating a strong and highly resistant structural repair mortar. BluCem HB55 is an economical high-performance product with low electrical resistivity and is suitable for repairs involving cathodic protection.

### Application Solutions

- Concrete protection
- Concrete repair
- Structural repairs of beams
- Columns and slabs
- Architectural repairs
- Floor repair and topping
- She-bolt hole repair
- Repairs to airport runways

### Project Specification Clause

SPRAYABLE SHOTCRETE - 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 HB55 manufactured by Bluey Technologies or equivalent shall be accepted.

### Project Examples

Airport construction, bridge repair, building repairs, dam construction and repair, jetty construction and repair, concrete structures, rail construction, rail repairs and shutdowns, retaining walls, sea wall repair and maintenance, sewer repair and lining, tunnel lining, tunnel rock support, wharf repair and construction.





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### Application Specification

#### CONCRETE PREPARATION

- 1.1 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.
- 1.2 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. The correct balance between roughening the surface and not causing further micro-cracking and damage should be trialled and assessed.
- 1.3 All surfaces must be free of dust, oils and surface contaminants. This may require steam cleaning or high pressure water blasting.
- 1.4 A perimeter edge of at least 10mm depth must be provided around the area for application.
- 1.5 Priming using BluCem API0 is recommended. Priming by saturation of the surface using 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 GP cement into a slurry using BluCem API0 and apply a cement rich coating to the steel surface.

#### MIXING

- 3.1 For wet applications, add BluCem HB55 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.
- 3.2 For dry applications, empty the dry powder directly into the hopper and adjust water and air at the nozzle for suitable consistency.

#### PUMPING

- 4.1 Special pumping and mixing equipment are required for BluCem HB55 which can be applied by either wet or dry spraying. Various models of batch mixers and continuous mixers are available for use. It is important to match your application's specifics with the capabilities of the mixer and pump. Bluey Technologies are able to recommend the right mixer for your project.
- 4.2 For wet spraying applications rinse the mixer and charge the pump hopper with sufficient water to flush and cool the pump and all grout lines thoroughly. Check to ensure that all lines and hoses are clear and unobstructed. Once grout is mixed, it is important to keep it agitated continuously prior to pumping.
- 4.3 For dry spraying applications, empty the dry powder directly into the hopper and adjust water and air at the nozzle for suitable consistency.
- 4.4 Following completion, dispose of excess production material in consideration of the environment. Carefully wash out machinery and surrounding areas.

#### APPLICATION TEMPERATURES

- 5.1 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.

#### 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

<b>Packaging</b>	20kg, 1000kg, 1200kg bags
<b>Water Addition</b>	2.0 - 2.4 litres per 20kg bag
<b>Yield</b>	9.4 litres per 20kg @ 11% water
<b>Build Scope</b>	Up to 300mm in one pass vertical; up to 150mm in one pass overhead
<b>Workability Time</b>	30 minutes @ 20°C
<b>Maximum Particle Size</b>	3.0mm

TESTED CHARACTERISTIC	STANDARD	RESULT
Portland Cement	AS3972	Complies
Aggregates	AS2758.0	Complies
Potable Water Applications	AS/NZS4020	Certified
Compressive Strength	AS1478.2 Appendix A	2.2 litres water per 20kg 4MPa @ 8 hours 20MPa @ 24 hours 50MPa @ 7 days 65MPa @ 28 days
Chloride Ion Content	AS1012.20	0.01%
Elastic Modulus	AS1012.17	34.5GPa
Drying Shrinkage	AS1012.13	330µstrain @ 7 days 550µstrain @ 28 days
Electrical Resistivity	Taywood-Warner 4 Probe	7000ohm-cm @ 7 days 9000ohm-cm @ 28 days 10000ohm-cm @ 56 days
Flexural Strength	AS1012.11	6.9MPa @ 7 days 7.3MPa @ 28 days
Setting Time	AS1012.18	Initial set - 110 minutes Final set - 180 minutes
Fresh Wet Density	AS1012.5	2270kg/m <sup>3</sup>