

# BluCem HE80AG

## EARLY STRENGTH GROUT WITH AGGREGATE

BluCem HE80AG is a one component cement powder and aggregate which requires only the addition of water to form a rapid curing micro concrete.

BluCem HE80AG is a pourable, fast setting product suitable for civil engineering applications. BluCem HE80AG incorporates special cement systems, blended aggregates and advanced additives to form a micro concrete which is C Class dual shrinkage compensated, chloride free and suitable for 100 year design life applications.

### Application Advantages

- Ultra rapid strength gain
- Suitable for deeper pours
- Large format batch mixing

### Lifecycle Advantages

- C Class
- Dual shrinkage control
- High chloride and sulphate resistance
- Chloride free
- 100 year durability

### About the Product

BluCem HE80AG is a blend of advanced cementitious powder and fine aggregate which has exceptionally high early strength development. This addition of aggregate allows the product to be batch mixed in agitators for large volume applications including road and runway repairs. BluCem HE80AG has been used on some of Australia's largest and most important infrastructure projects where time is a critical factor.

### Application Solutions

- Concrete repair
- Structural repair of beams
- Columns and slabs
- Airport lighting installation
- Airport runway repairs
- Precast grouting
- Underpinning

### Project Specification Clause

EARLY STRENGTH GROUT WITH AGGREGATE - The rapid curing micro concrete used for this project shall be a one component cement powder and aggregate which requires only the addition of water to form a durable rapid curing 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 HE80AG manufactured by Bluey Technologies or equivalent shall be accepted.

### Project Examples

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

#### MIXING

- 2.1 Measure and place 80% of the specified volume of potable water to the high shear mixing vessel. Start mixer and slowly add BluCem HE80AG powder. If powder addition is too fast then large lumps will form and final mix will be slow reaching uniform consistency. Following addition of all powder, mix for 1 - 2 minutes or until uniform consistency then add final 20% of potable water. More or less water may be added within the ratio limits specified on this data sheet. Do not mix more material than can be placed in 20 minutes.

#### PLACEMENT

- 3.1 Once the grout has been mixed you need an effective placement method to deliver it to the area of application. BluCem HE80AG is a micro concrete and therefore best mixed using tumble style agitators. It is also best to pour or pump shorter distances using concrete pumps. Bluey Technologies are able to recommend the right mixer for your project.
- 3.2 Prior to placing grout, 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. If the grout is allowed to sit then it will 'gel' and may become more difficult to pump, or otherwise set earlier than expected.
- 3.3 Once the site is ready for grout placement, commence pumping. It is important to pump continuously and avoid the formation of cold joints.
- 3.4 Following completion, dispose of excess production material in consideration of the environment. Carefully wash out mixer tanks and agitators into the pump hopper and pump the resulting washout material through the grout hoses to a suitable disposal site. Drain any water out of the lines and hoses. Clean down the machinery and surrounding areas.

#### APPLICATION TEMPERATURES

- 4.1 The mix water's temperature should be kept as low as possible to prevent the grout from hydrating too rapidly.
- 4.2 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.
- 4.3 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.
- 4.4 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.

#### APPLICATION

- 5.1 BluCem HE80AG may be poured or pumped into place. Do not exceed the maximum application thicknesses specified in the data sheet for any wet layer. Consult Bluey Technologies for further information about aggregate addition for large volume pours.

#### 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, 1000kg, 1200kg bags
Water Addition	2.0 - 2.4 litres per 20kg bag
Yield	9.5 litres per 20kg @ 10% water, 9.9 litres per 20kg @ 12% water
Application Thickness	Refer to Bluey Technologies for advice and approval on pour thicknesses with dimensions >100mm
Pot Life	30 - 60 minutes @ 20°C Agitated, 10 - 30 minutes @ 20°C Still 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	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	2.0 litres water per 20kg Pourable 20MPa @ 2 hours 30MPa @ 3 hours 40MPa @ 4 hours 60MPa @ 24 hours 80MPa @ 7 days 90MPa @ 28 days  2.2 litres water per 20kg Pourable 15MPa @ 2 hours 25MPa @ 3 hours 35MPa @ 4 hours 50MPa @ 24 hours 60MPa @ 7 days 80MPa @ 28 days  2.4 litres water per 20kg Flowable 10MPa @ 2 hours 15MPa @ 3 hours 25MPa @ 4 hours 40MPa @ 24 hours 50MPa @ 7 days 70MPa @ 28 days
Flexural Strength	ASTM C 348	9.7MPa
Bond Strength	EN 1542: 1999	>1.5MPa
Modulus of Elasticity	AS1012.17	26.0GPa @ 3.5 hours 28.1GPa @ 3 days 33.8GPa @ 28 days
Indirect Tensile Strength	AS1012.1	4.3MPa @ 3.5 hours 4.5MPa @ 3 days 5.7MPa @ 28 days
Coefficient of Thermal Expansion	AASHTO Designation: T 336 - II	13.7µstrain/°C
Drying Shrinkage	AS1478.2	110µstrain @ 7 days 160µstrain @ 28 days 170µstrain @ 56 days
Electrical Resistivity	Taywood-Warner 4 Probe	7000ohm-cm @ 7 days 21000ohm-cm @ 28 days 35000ohm-cm @ 56 days
Setting Time	AS1012.18	Initial set - 25 minutes Final set - 40 minutes
Fresh Wet Density	AS1012.5	2310kg/m³ @ 10% water 2260kg/m³ @ 12% water

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## Contact Bluey

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## IMPORTANT NOTICE

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