



# BluCem LH60

## DEEP POUR ENGINEERED MICRO CONCRETE

BluCem LH60 is a one component cement powder and aggregate which requires only the addition of water to form a deep pour micro concrete.

BluCem LH60 is a pumpable, deep pour product suitable for civil engineering applications. BluCem LH60 incorporates specially graded aggregates and advanced cement additives to form a micro concrete which is Class C dual shrinkage compensated, low heat reacting, alkali-silica reaction free, ultra low permeability, high thermal conductive and low electrical resistive.

### Application Advantages

- Low exothermic curing
- Highly fluid and self compacting
- Long pump life

### Lifecycle Advantages

- Class C dual shrinkage compensated
- Low thermal shrinking
- Potable water certified AS/NZ 4020
- Ultra low permeability
- High thermal conductivity
- Low electrical resistivity

### About the Product

BluCem LH60 creates low exothermic heat during hydration through its use of slower reacting cements and specially selected thermally conductive aggregates. This allows the product to remain cool during placement of large pours and also allows the grout to effectively transmit heat during service life. Being fully shrinkage compensated and low exothermic heat generating makes BluCem LH60 suitable for a range of deep pour applications where low heat is necessary to protect surrounding services and minimise thermal shrinkage.

### Application Solutions

- Concrete repair
- Structural repair of beams
- Columns and slabs
- Deep pouring of beam and columns
- Form and pour grouting
- Pile grouting
- HV cable grouting
- Precast grouting

### Project Specification Clause

DEEP POUR ENGINEERED MICRO CONCRETE - The deep pour 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 deep pour 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 LH60 manufactured by Bluey Technologies or equivalent shall be accepted.

### Project Examples

Airport construction, bridge repair, building repairs, dams construction and repair, jetties 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

#### MIXING

- 1.1 Measure and place 85% of the specified volume of potable water to the high shear mixing vessel. Slowly add BluCem LH60 powder. Following addition of all powder, mix for 1 - 2 minutes or until uniform consistency then add final 15% of potable water. More or less water may be added within the ratio limits specified. Do not mix more material than can be placed in 30 minutes.

#### PUMPING

- 2.1 Once the grout has been mixed you need an effective pumping method to deliver it to the area of application. BluCem LH60 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.
- 2.2 Prior to pumping 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. Although, this product has a long pot life, if the grout is allowed to sit then it will 'gel' and may become more difficult to pump.
- 2.3 Once the site is ready for grout placement, commence pumping. It is important to pump continuously and avoid the formation of cold joints.
- 2.4 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

- 3.1 The mix water's temperature should be kept as low as possible to prevent the grout from hydrating too rapidly.
- 3.2 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.
- 3.3 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.
- 3.4 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

- 4.1 BluCem LH60 may be poured or pumped into place. All defective host substrate must be removed prior to application. A concrete corrosion expert must be consulted for critical projects or structural applications. Host concrete must be roughened to ensure good bond. All surfaces must be free of dust, oils and surface contaminants. A perimeter edge of at least 10mm depth must be provided around the repair area. Priming using BluCem API0 or by saturation of the surface using water is recommended. Application of BluCem LH60 must commence within 4 hours of primer application.

#### CURING

- 5.1 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

Packaging	20kg, 1000kg, 1200kg bags
Water Addition	2.0 - 2.8 litres per 20kg bag
Yield	10.0 litres per 20kg @ 12% water
Application Thickness	Refer to Bluey Technologies for advice and approval on pour thicknesses with dimensions exceeding 250mm
Pump Life	240 minutes @ 20°C
Maximum Particle Size	3.0mm

TESTED CHARACTERISTIC	STANDARD	RESULT
Portland Cement	AS3972	Complies
Aggregates	AS2758.0	Complies
Compressive Strength	AS1478.2 Appendix A	2.0 litres water per 20kg Pourable 30MPa @ 24 hours 70MPa @ 7 days 95MPa @ 28 days 2.4 litres water per 20kg Flowable 20MPa @ 24 hours 55MPa @ 7 days 80MPa @ 28 days 2.8 litres water per 20kg Flowable 15MPa @ 24 hours 45MPa @ 7 days 70MPa @ 28 days
Chloride Content	AS1012.20	<0.01%
Chloride Diffusion	Nordtest NT Build 443	$0.85 \times 10^{-12} \text{m}^2/\text{second}$ @ 12% water
Chloride Ion Penetrability	ASTM C1202	Low @ 12% water
Modulus of Elasticity	AS1012.17	30.5GPa @ 12% water
Early Volume Change	AS1478.2 Appendix E	1.13%
Change in Height	ASTM C1090	Positive through to 28 days
Bleeding	ASTM C940	Zero @ 14% water
Drying Shrinkage	AS1478.2	360µstrain @ 7 days @ 12% water 440µstrain @ 28 days @ 12% water 450µstrain @ 56 days @ 12% water
Electrical Resistivity	Taywood-Warner 4 Probe	6100ohm-cm @ 7 days @ 11% water 29000ohm-cm @ 28 days @ 11% water
Flexural Strength	ASTM C348	9.1MPa @ 28 days @ 12% water
Indirect Tensile Strength	AS1012.18	6.2MPa @ 1 day @ 12% water 6.4MPa @ 7 days @ 12% water 6.7MPa @ 28 days @ 12% water
Setting Time	AS 1012.18	Initial set - 590 minutes Final set - 670 minutes
Thermal Resistivity	IEEE Standard 442	0.46km-W
Fresh Wet Density	AS1012.5	2240kg/m <sup>3</sup> @ 12% water



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