Technical Data Sheet

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

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. 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 trialled and assessed using adhesion test methods following initial preparation trials.

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 Priming using BluCem AP10 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 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

3.1 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.

3.2 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.

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 LH60 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
Supply	Wet mix per m^3 delivered to site
Water Addition	2.4 - 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	60 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 85MPa @ 28 days 2.8 litres water per 20kg Flowable 15MPa @ 24 hours 45MPa @ 7 days 60MPa @ 28 days
Chloride Content	AS1012.20	<0.01%
Chloride Diffussion	Nordtest NT Build 443	0.85 x 10^{-12} m^2/second @ 12% water
Cloride 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	5500ohm-cm @ 7 days @ 14% water 19000ohm-cm @ 28 days @ 14% 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	AS1012.18	Initial set - 590 minutes Final set - 670 minutes
Thermal Resistivity	IEEE Standard 442	0.69km-W
Fresh Wet Density	AS1012.5	2240kg/m^3 @ 12% water
Potable Water Applications	AS/NZS 4020	Certified

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Contact Bluey

HEAD OFFICE QLD

1300 0 BLUEY | qld@bluey.com.au

bluey.com.au

NSW
nsw@bluey.com.au

VIC
vic@bluey.com.au

SA
sa@bluey.com.au

WA
wa@bluey.com.au

TAS
tas@bluey.com.au

ACT
act@bluey.com.au

NT
nt@bluey.com.au

NZ
nz@bluey.com.au

UK/EUROPE
bluey@bluey.ie

ASIA PACIFIC
sales_sg@quicseal.com

IMPORTANT NOTICE