



BluCem LH60 UW

DEEP POUR UNDERWATER MICRO CONCRETE



BluCem LH60 UW is a one component cementitious powder and aggregate which requires only the addition of water to form an underwater applied cementitious micro concrete.

BluCem LH60 UW has been designed as an anti-washout, pumpable and deep pour, long pump life product suitable for civil engineering applications. BluCem LH60 UW 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

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

Lifecycle Advantages

- Class C dual shrinkage compensated
- Ultra low permeability
- Suitable for 100 year design life applications
- Low thermal shrinking
- High thermal conductivity
- Low electrical resistivity

About the Product

BluCem LH60 UW is a durable, shrinkage compensated micro concrete which can be placed underwater without washing-out or losing strength. The micro concrete contains special anti-dispersing agents combined with special cements, additives and selected aggregates to produce a versatile and very high performance marine micro concrete. The product can be used in a range of applications where it is not possible to create a dry working environment. BluCem LH60 UW is a technically advanced marine grade micro concrete which has unique properties in terms of volumetric stability and strength gain with the added benefit of underwater placement capabilities, where deep pour thicknesses are required.

Application Solutions

- Pile reinstatement
- Sea walls
- Rock grouting
- New marine structures
- Marine repairs
- Undersea void filling

Project Specification Clause

DEEP POUR UNDERWATER MICRO CONCRETE - The underwater applied cementitious micro concrete used for this project shall be a one component cementitious powder and aggregate which requires only the addition of water to form a non-dispersing underwater applied 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 UW manufactured by Bluey Technologies or equivalent shall be accepted.

Project Examples

Wharf upgrades, new marine structures, port maintenance, tunnels, dams.





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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. Host concrete must be roughened and aggregate exposed to ensure good bond. Mechanical chipping or shot blasting of the surface is recommended for this purpose. All surfaces must be free of dust, oils and surface contaminants.

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 LH60 UW 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.

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.

PUMPING

- 4.1 Once the grout has been mixed you need an effective pumping method to deliver it to the area of application. Various models of batch mixers and continuous mixers are available for use, all with varying specifications. 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 Once the site is ready for grout placement, commence pumping. It is important to pump continuously and avoid the formation of cold joints.
- 4.3 Clean down the machinery and surrounding areas on a regular basis to prevent grout blocking lines and pumps. Following completion, dispose of excess production material in consideration of the environment.

PLACEMENT

- 5.1 The product may be poured or pumped into place. Check formwork for leaks prior to mixing and application of grout. Do not exceed the maximum application thicknesses specified in this data sheet for any wet layer. Best practice in placing underwater grouts is to always have the delivery end of the pump line immersed into the placed grout. This will minimise risk of water infiltration into the grout. Consult Bluey Technologies for further information about aggregate addition for large volume pours.

CURING

- 6.1 No special curing techniques are required.



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Product Data

Please refer to Important Notice on following page

Packaging	20kg, 1000kg, 1200kg bags
Water Addition	2.2 - 2.3 litres per 20kg bag
Yield	9.9 litres per 20kg @ 11.5% 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	2.3 litres water per 20kg Flowable 20MPa @ 24 hours 60MPa @ 7 days 80MPa @ 28 days
Early Volume Change	AS1478.2 Appendix E	1.83%
Change in Height	ASTM C1090	Positive through to 28 days
Bleeding	ASTM C940	Zero @ 11% water
Slump Flow	ASTM C1621 (B)	835mm @ 11.5% water
J Ring Flow	ASTM C1621 (B)	820mm @ 11.5% water
Passing Ability	ASTM C1621 (B)	15mm @ 11.5% water
Visual Stability Index (VSI)	ASTM C1621 (B)	0
Drying Shrinkage	AS1478.2	510 μ strain @ 7 days @ 11% water 615 μ strain @ 28 days @ 11% water
Flexural Strength	ASTM C348	12.8MPa @ 28 days @ 11% water
Setting Time	AS1012.18	Initial set - 700 minutes Final set - 850 minutes
Fresh Wet Density	AS1012.5	2270kg/m ³ @ 11% water



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