

BluCem HSI20

ULTRA HIGH STRENGTH GROUT

BluCem HSI20 is a one component cement powder which requires only the addition of water to form an ultra high strength cementitious grout.

BluCem HSI20 is a pumpable, non shrink product suitable for civil engineering applications. BluCem HSI20 incorporates specially graded aggregates and advanced cement additives to form a cementitious grout which is Class C dual shrinkage compensated, high strength, low permeability and suitable for 100 year design life applications.

Application Advantages

- Highly fluid and self compacting
- Long pump life
- Early age strength development
- High ultimate strength

Lifecycle Advantages

- C Class
- Dual shrinkage control
- High strength
- Low permeability
- 100 year design life

About the Product

BluCem HSI20 is a highly fluid, volumetrically stable, Class C grout which has both early and long term shrinkage compensating additives. This allows grout to be placed in critical applications and ensures elimination of shrinkage cracking or settlement. BluCem HSI20 has been formulated to ensure that expansion is staged to compensate shrinkage both in the plastic and drying states.

Application Solutions

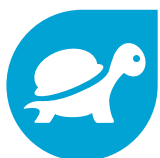
- Concrete repair
- Structural repairs of beams
- Columns and slabs
- Wind turbines
- Precast grouting
- Off shore pile/sleeve grouting

Project Specification Clause

ULTRA HIGH STRENGTH GROUT - The high strength cementitious grout used for this project shall be a one component cement powder which requires only the addition of water to form a durable high strength 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 HSI20 manufactured by Bluey Technologies or equivalent shall be accepted.

Project Examples

Wind turbines, rail supports, bearing supports, airport construction, bridge repair, building repairs, dam construction and repair, jetty construction and repair, concrete structures, rail construction, retaining walls, 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 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 HSI20 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.

PUMPING

- 3.1 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.
- 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.
- 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 HSI20 may be poured or pumped into place. Do not exceed the maximum application thicknesses specified in the data sheet for any wet layer. When pouring BluCem HSI20, reduce exposed surface areas to ensure maximum confinement during expansion phase of initial set. 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 bags
Water Addition	2.0 - 2.4 litres per 20kg bag (10 - 12% b/w)
Yield	9.8 litres per 20kg @ 12% water
Application Thickness	Refer to Bluey Technologies for advice and approval on pour thicknesses with dimensions exceeding 100mm
Pump Life	90 minutes @ 20°C
Maximum Particle Size	<3.0mm

TESTED CHARACTERISTIC	STANDARD	RESULT
Portland Cement	AS3972	Complies
Aggregates	AS2758.0	Complies
Flow Test	BS Cone	270mm
Compressive Strength	BS EN 12190	10% water 80MPa @ 1 day 100MPa @ 7 days 120MPa @ 28 days 11% water 65MPa @ 1 day 100MPa @ 7 days 110MPa @ 28 days 12% water 60MPa @ 1 day 95MPa @ 7 days 105MPa @ 28 days
Flexural Strength	BS EN 196-1	2.4 litres water per 20kg 8.0MPa @ 7 days 11.0MPa @ 28 days
Change in Height	ASTM C1090	Positive through to 28 days
Expansion	ASTM C940	0.6%
Bleeding	ASTM C940	0%
Setting Time		Initial set - 120 minutes Final set - 140 minutes
Fresh Wet Density	AS1012.5	2210kg/m ³
Indirect Tensile Strength	AS1012.1	9MPa
Modulus of Elasticity	AS1012.17	43GPa
Bond Strength	EN1542: 1999	2MPa

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IMPORTANT NOTICE

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