Technical Data Sheet

BluCem HS400Plus

ACID RESISTANT THIXOTROPIC GROUT

BluCem HS400Plus is a one-component cement powder which requires only the addition of water to form an acid resistant, thixotropic, cementitious grout.

BluCem HS400Plus is a pumpable, top-down applied product suitable for civil engineering applications. BluCem HS400Plus incorporates an acid resistant binder, special fillers, silica fume and additives to form a cementitious grout which has low chloride content, low porosity, is highly durable, and is aluminium and metallic expansion agent free.

Application Advantages

- Pumpable
- Gravity resistant
- High early strength

Lifecycle Advantages

- Acid resistant
- Low porosity
- Highly durable
- Aluminium and metallic expansion agent free
- High load transfer to rock

About the Product

BluCem HS400Plus is an acid resistant, thixotropic grout which, due to its unique blend of cement and fillers, is pumpable under pressure whilst resisting flow due to gravity forces. These unique thixotropic properties allow the grout to be reliably utilised in top-down applications such as overhead rock bolting, creating a fully encapsulated bolt without cavities or voids. The highly acid resistant binder system contained in BluCem HS400Plus allows the product to be applied in permanent applications where acidic and contaminated groundwater may be present. BluCem HS400Plus is an advanced cementitious product designed to provide additional design life in challenging ground conditions.

Application Solutions

- Rock bolt grouting in contaminated ground
- Rock fissure grouting in contaminated ground
- Top-down grouting of rock bolts
- Void filling where thixotropic properties are required

Project Specification Clause

THIXOTROPIC GROUT - The thixotropic cementitious grout used for this project is a one component cement powder which requires only the addition of water to form a durable, acid resistant, thixotropic product. The product has independent testing to validate the performance outlined in the technical data table on the following pages. BluCem HS400Plus manufactured by Bluey Technologies or equivalent shall be accepted.

Project Examples

Tunnel rock support, road cuttings, slab stabilisation.

BluCem HS400Plus

ACID RESISTANT THIXOTROPIC GROUT

Application Specification

MIXING

1.1 Measure and place 90% of potable water into a high shear mixing vessel. Start mixer and then slowly add BluCem HS400Plus powder. If powder addition is too fast then large lumps will form and final mix will be slow reaching uniform consistency. Finally add remaining water to reach the desired consistency. Following addition of all powder and water ingredients, it is critical that mixing is continued for a further 4 - 5 minutes to adequately dissolve all powder components and achieve final consistency.

PUMPING

2.1 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.

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.

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 HS400Plus must be pumped into place. Check ducts and forms for leaks prior to mixing and application of grout. Mix at low speed during pumping and placement to maintain work life. High speed mixing should be avoided during placement to prevent temperature rise of the mixed grout. Once pumping operations commence, continuous flow of grout is essential, therefore sufficient grout for the void must be prepared prior to placement. Pump grout into the bolt hole and do not stop until grout emerges from the bottom of the hole.

CURING

5.1 Any exposed surface layers must be covered until initial set to prevent surface crazing. It is recommended that the final surface finish layer is coated with curing compound or otherwise maintained wet for at least 24 hours.

BluCem HS400Plus

ACID RESISTANT THIXOTROPIC GROUT

Product Data

Please refer to Important Notice on following page

Packaging	20kg bags
Water Addition	6.0 - 6.8 litres per 20kg bag. Recommended 6.4 litres per 20kg bag
Yield	12.8 litres per 20kg bag @ 32% water
Pump Life	60 minutes @ 20°C
Maximum Particle Size	45 microns (90% passing)

TESTED CHARACTERISTIC	STANDARD	RESULT
Aggregates	AS2758.0	Complies
Compressive Strength	AS1478.2	6.4 litres water per 20kg 20MPa @ 1 day 40MPa @ 7 days 50MPa @ 28 days
Chloride Ion Content	AS2350.2	0.046%
Bleeding	ASTM C940	0% @ 32% water
Drying Shrinkage	AS2350.13	<650μstrain @ 56 days @ 32% water
Chloride Diffusion	NT 443	1.56 x 10^{-11} m^2/second @ 32% water
Water Penetration	BS EN12390-8	<18mm (complies to RMS B80 specifications)
ACCELERATED AGEING TESTS*		
Ammonia Sulphate Solution (1500ppm) **@ 20deg** **@ 38deg** **@ 60deg**		No detrimental loss of chemical or physical properties under XRD analysis
Ammonia Sulphate Solution (1500ppm) **@ 20deg** **@ 38deg** **@ 60deg**		No loss of compressive strength @ 28 days >50MPa >50MPa >50MPa
Acid Solution (2% v/w H_2SO_4)	BRANZ Test method	24 months exposure Weight loss/gain <2%

** Contact Bluey Technologies for a copy of the test reports.*

BluCem HS400Plus

ACID RESISTANT THIXOTROPIC GROUT

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