MasterCrete LH 5460

Deep pour engineered micro concrete

Material Description

MasterCrete LH 5460 is a single-component, cement-based powder mixed with specially graded aggregates, requiring only water to create a high-performance deep pour micro concrete.

Designed for civil engineering applications, MasterCrete LH 5460 is a pumpable solution that features advanced cement additives. The micro concrete is Class C dual shrinkage compensated, exhibits low heat generation, and is free from alkali-silica reactions. It also offers ultra-low permeability, excellent thermal conductivity, and low electrical resistivity.

Areas of Application

- Restoration of damaged concrete structures such as columns, beams, and foundations in infrastructure projects like bridges, tunnels, Marine structure repairs, including piers and wharves and retaining walls.
- Filling voids, honeycombs, or large cracks.
- Ideal for deep pours with low heat generation.
- Suitable for thick concrete sections.
- .Grouting for precast elements and base plates.
- Installation of heavy-duty industrial flooring and machinery bases.
- Applications requiring low electrical resistivity and high thermal conductivity.

Characteristics and Benefits

- Deep pour capabilities - engineered for deep pour applications with controlled setting and curing properties.
- Pumpable - easy to handle and suitable for pumping over long distances or difficult-to-access areas.
- Dual shrinkage compensation - minimizes the risk of cracking by compensating for both plastic and drying shrinkage.
- Low heat of hydration - reduces thermal stresses, making it suitable for large volume pours.
- Alkali-silica reaction free - prevents harmful reactions that could compromise the durability of the concrete.
- Ultra-low permeability - provides excellent resistance to water ingress and aggressive chemicals.
- High thermal conductivity - effective in heat transfer, ideal for environments where thermal stability is essential.
- Low electrical resistivity - suitable for applications requiring electrical conductivity.
- Enhanced durability & crack resistance - offers long-term performance and reduces the risk of cracking during the curing process.
- Approved to AS/NZS 4020:2018 (tested to the maximum exposure level) - suitable for contact with potable water.

Properties

Technical Charastristics/ /Standard	Test results
Compressive strength MPa @ 12% /14% water AS 1478.2 App. A	1 day: 30 / 15 7 days: 70 /45 28 days: 85 /60
Drying Shrinkage (μ strain) @ 12% water AS1478.2	7 days:360 28 days:440 56 days: 450
Early Volume Change AS1478.2 Appendix E	1.13%
Modulus of Elasticity @ 12% water AS1012.17	30.5GPa
Setting Time (minutes) AS1012.18	Initial set - 590 Final set - 670
Fresh Wet Density kg/m^3 @ 12% water AS1012.5	2240
Indirect Tensile Strength MPa @ 12% water AS1012.18	1 day: 6.2 7 days: 6.4 28 days: 6.7
Chloride Content AS1012.20	<0.01%
Chloride Diffusion (m^2/second) Nordtest NT Build 443	0.85 x 10^{-12}
Chloride Ion Penetrability @ 12% water ASTM C1202	Low
Change in Height ASTM C1090	Positive (28 days)
Bleeding @ 14% water ASTM C940	Zero
Electrical Restivity ohm-cm @14% water Taywood-Warner 4 Probe	7 days: 5500 28days:19000
Flexural Strength MPa 12% water ASTM C348	28 days: 9.1
Thermal Restivity km-W IEEE Standard 442	0.69

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Application Properties	Results
Water addition (litres per 20kg bag)	2.4 - 2.8
Thickness range	20-250mm
Pump life @ 20°C	60 minutes
Maximum particle size	3.0mm

Application

For detailed application methodology, please refer to "Cementitious concrete repair MasterCrete repair mortars" application guide.

Surface Preparation

Concrete must be fully cured with a minimum direct tensile strength of 1.5 MPa. All loose traces of concrete or mortar, dust, grease oil, etc. must be removed. Damaged or contaminated concrete shall be removed to obtain a keyed aggregate exposed surface. Non-impact/ vibrating cleaning methods, e.g. grit or high pressure water blasting are recommended. Scabble to a surface profile of ICRI CSP 7 or greater. Cut the edges of the repair vertically to a minimum depth of 15 mm.
Clean all exposed reinforcement to a minimum grade

Mixing

Only full bags are mixed. Damaged or opened bags should not be used. Measure and place 85% of the specified volume of potable water to the high shear mixing vessel. Slowly add MasterCrete LH 5460 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. Only use clean water.
Mixing water needed: 2.4 - 2.8 litres per 20kg bag depending upon consistency required.
The mix water's temperature should be kept as low as possible to prevent the grout from hydrating too rapidly.

As with the water temperature, the higher the air temperature the more quickly the grout hydrates and sets. Master Builders Solutions 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.

Priming Concrete

No special primer is required other than pre-soaking for form and pour applications.
For horizontal repairs when additional structural bond required, consider using MasterStrength 2525 to bond the MasterCrete LH 5460 to the substrate.
MasterKure 111 evaporation retarder and finishing aid can be used on larger applications and in hot dry windy exposed conditions.

Application

The minimum temperatures must be maintained during application and for at least 24 hours thereafter for optimum curing of the product. The prepared substrate should be pre-soaked, preferably for 24 hours, but at least 2 hours before applying MasterCrete LH 5460.
The surface must be saturated surface dry, but without standing water. MasterCrete LH 5460 can be poured or pumped into formwork. Leave formwork in place whilst the material sets preferably 48 hours but at least 24 hours.
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.
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.

Curing

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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Estimating Data

One 20kg bag will yield approximately 10 litres of mortar @ 12% water:

MasterCrete 5350				
20kg	Thickness in mm /m^2	m^3	bags /m^3	m^2/mm thickness
10L	10mm	0.01	100	10

Packaging

MasterCrete LH 5460 is available in 20kg and bulk bags.

Storage & Shelf Life

Store in cool and dry warehouse conditions. Shelf life in these conditions is 12 months in unopened original bags.

Precautions

For the full health and safety hazard information and how to safely handle and use this product, make sure that you obtain a copy of the Safety Data Sheet (SDS) from our office or website.

Specification Clause

Deep Pour Engineered Micro Concrete - The deep pour micro concrete used for this project shall be a one component pre-blended product cement powder and aggregate which requires only the addition of water to form a durable deep pour product. It shall be that has independent testing to validate the performance outlined in the technical data table on the property section. MasterCrete LH 5460 manufactured by Master Builders Solutions or equivalent shall be accepted.

Disclaimer

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