

# MasterCrete 855 (formerly BluCem HB55)

Premium cementitious spray applied repair mortar for cathodic protection overlays

## Material Description

**MasterCrete 855** is a wet or dry sprayable, high build repair mortar suitable for civil engineering applications. **MasterCrete 855** incorporates specially graded aggregates and advanced cement additives to form a cementitious mortar with low drying shrinkage, ultra low chloride permeability, high alkalinity, low electrical resistance and high strength.

**MasterCrete 855** is an economical high-performance product with low electrical resistivity and is suitable for repairs involving cathodic protection.

## Areas of Application

- Repairing areas of concrete that have spalled due to environmental exposure or mechanical damage or where impressed current cathodic protection systems are used.
- Repairs to the underside of bridge decks, piers and beams
- Airport construction
- Building repairs
- Dam, Jetty, wharf, Retaining walls, sea wall construction and repair
- Rail construction and repairs
- Sewer repair and lining,
- Tunnel lining, tunnel rock support

## Characteristics and Benefits

- High build in one pass - achieves a thick repair layer in a single application, minimising the need for multiple coats.
- Minimal rebound - reduces material loss during application, ensuring efficient use.
- Easy spraying - compatible with both dry and wet spraying methods for versatile application.
- Low drying shrinkage - minimises cracking risk for stable, long-lasting repairs.
- High alkalinity - protects the substrate from corrosion by maintaining a highly alkaline environment.
- Low electrical resistance - ideal for applications involving cathodic protection.
- Enhanced durability - high strength and low electrical resistance protect concrete structures over time.

## Properties

Supply Form	Cementitious preblend Powder
Water addition	2.0 - 2.4 litres per 20kg bag
Build scope	Up to 300mm in one pass vertical; Up to 150mm in one pass overhead
Workability time	30 minutes @ 20°C
Maximum particle size	3.0mm

## Performance Data

Characteristic (Standard)	Result
Compressive strength (AS 1478.2 Appendix A)	4MPa @ 8 hours 20MPa @ 24 hours 50MPa @ 7 days 65MPa @ 28 days
Chloride Ion content (AS1012.20)	0.01%
Elastic Modulus (AS1012.17)	34.5 GPa
Drying Shrinkage (AS1012.13)	330µstrain @ 7 days 550µstrain @ 28 days
Electrical Restivity (Taywood-Warner 4 Probe)	7000ohm-cm @ 7 days 9000ohm-cm @ 28 days 10000ohm-cm @ 56days
Flexural Strength (AS1012.11)	6.9MPa @ 7 days 7.3MPa @ 28 days
Setting Time (AS1012.18)	Initial set – 110 mins Final set – 180 mins
Fresh Wet Density (AS 1012.5)	2270 kg/m <sup>3</sup>

## Application

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

## Concrete Preparation

All defective areas must be removed prior to application. This includes cracked or structurally weakened surfaces and also chloride contaminated and carbonated concrete. Concrete substrate must be roughened and aggregate exposed to achieve a recommended minimum CSP3 surface finish.

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All surfaces must be free of dust, oils and surface contaminants. A perimeter edge of at least 10mm depth must be provided around the area for application.

For structural repairs to existing concrete members, saturate the properly prepared concrete surface for a minimum of 7 hours prior to shotcreting. This is accomplished by spraying just water or a very thin, wet mix, as a slurry coat such as **MasterCrete PRI 5000** or **MasterCrete PRI 157** onto the prepared surface and then continuing with the normal shotcrete.

Note: Priming with epoxy primers or other products which prevent vapour transmission is not recommended.

## Steel Preparation

All loose material should be removed, and the reinforcing steel exposed to the point where there is no visible rust and a grey surface colour is observed.

The reinforcing steel should be exposed on all sides so that you are able to fit a gloved hand behind the bar.

If the reinforcing steel has lost a significant amount of its cross-sectional area (approximately 20% is classified as significant) it may need to be replaced or additional steel installed. The replacement should be determined by the engineer, especially in structural applications.

The steel should be cleaned to an SA Class 2.5 and all rust removed.

If the steel will be exposed to the atmosphere for several days after cleaning then an acceptable form of priming would be to a slurry using **MasterCrete PRI 5000** and apply a cement rich coating to the steel surface.

## Mixing

For wet applications, add **MasterCrete 855** to potable water in a clean vessel using a high shear mechanical mixer for at least three minutes. Do not mix more material than can be placed in 15 minutes. Add 2.0 – 2.4 litres to achieve the desired consistency within the water ratio limits specified. For dry applications, empty the dry powder directly into the hopper and adjust water and air at the nozzle for suitable consistency.

## Pumping

Special pumping and mixing equipment are required for **MasterCrete 855** which can be applied by either wet or dry spraying. Various models of batch mixers and continuous mixers are available for use. It is important to match your application's specifics with the capabilities of the mixer and pump. Master Builders Solutions are able to recommend the right mixer for your project.

For wet spraying applications 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.

For dry spraying applications, empty the dry powder directly into the hopper and adjust water and air at the nozzle for suitable consistency. Following completion, dispose of excess production material in consideration of the environment. Carefully wash out machinery and surrounding areas.

Note: 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. Exposing the pumping hoses to the sun on a hot day accelerates the product's set time.

## Curing

Proper curing is extremely important. Wet curing is recommended for the first 3-5 days, after that time continue curing by the use of a quality curing compound such as **MasterKure 250**.

## Estimating Data

One 20kg bag mixed with 11% water will yield approximately 9.4 litres. This will cover 9.4m<sup>2</sup> at 1mm thickness.

20 kg MasterCrete 855 mixed with 2.0 – 2.4 litres				
Yield L	Thickness mm /m <sup>2</sup>	Volume m <sup>3</sup>	20kg bags for 1m <sup>3</sup>	Area m <sup>2</sup> /1mm
9.4	9.4	0.0094	106	9.4



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## Packaging

MasterCrete 855 is available in 20kg 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

Sprayable Shotcrete - The concrete repair cementitious mortar used for this project shall be a one component preblended cementitious powder which requires only the addition of water to form a durable sprayable product for both dry and wet shotcrete applications. The performance criteria of product shall be superior or equivalent to the results outlined in the Performance Data table and tested by Independent testing lab to validate. MasterCrete 855 or MasterCrete CI 822 manufactured by Master Builders Solutions or equivalent shall be accepted.

## Disclaimer

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