

# MasterEmaco S 5440CI

Shrinkage compensated, flowable, structural repair mortar with active corrosion inhibition

## Material Description

MasterEmaco S 5440CI is a single component, extra high-strength, high modulus, shrinkage compensated structural repair mortar that meets the requirements of EN 1504 part 3 class R4. MasterEmaco S 5440CI contains Portland cement, graded sands and special additives to significantly reduce the risk and incidence of shrinkage cracking. When mixed with water, it forms a highly fluid mortar that can easily be pumped or poured into formwork.

## Areas of Application

MasterEmaco S 5440CI is used for the structural repair of concrete elements such as:

- Columns, piers and cross beams of all bridges
- Cooling towers and chimneys and other industrial environments
- Marine structures, water treatment and sewerage facilities
- Tunnels, pipes, outfalls and all below ground construction especially in harsh ground conditions
- All form and pour repairs

## Characteristics and Benefits

- Versatile – can be applied in extreme environments where active corrosion inhibition is required.
- Shrinkage compensated – minimises crack tendency.
- Highly fluid – can be applied by pump (eg Putzmeister SP 11) or pouring into formwork.
- High early and ultimate strengths – matches high strength concrete found in structures.
- High modulus and excellent adhesion – ensuring load transfer in structural repair.
- Excellent freeze/thaw resistance – suitable for all climates.
- High carbonation resistance – suitable for exposed repairs in urban environments.
- Sulphate resistant – suitable for contact with ground waters.
- Very low permeability – protection of reinforcing steel.
- Low chromate (Cr[VI] < 2 ppm) – low risk of skin irritation.
- Chloride-free – does not add to the chloride load in contaminated structures.

- Approved to AS/NZS 4020:2018 (tested to the maximum exposure level) - suitable for contact with potable water.

## Properties

Appearance	Grey powder
Layer thickness	Min. 20mm Max. 500mm
Density	Approx. 2.2 g/cm <sup>3</sup>
Mixing water per 20kg bag	Approx. 2.2-2.5 litres
Working time	45 – 60 minutes
Application Temperature (support and material)	Between +5 and +35°C
Compressive strength - after 1 day - after 7 days - after 28 days AS 1478.2 Appendix A (Restrained)	≥ 40 MPa ≥ 50 MPa ≥ 80 MPa
E-Modulus (28 days) AS1012	~39GPa
Shrinkage	80 microstrain at 56 days
Carbonation resistance EN 13295	≤ reference concrete
Resistivity	7 days 23 KOhm-cm 28 days 108 KOhm-cm 56 days 158 KOhm-cm
Cracking tendency (I) Coutinho type ring	No cracking after 180 days
Potable water contact AS4020:2018	Passed
VOC Content SCAQMD Test method 304-91	≤20g/L

## Application

### 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.

# MasterEmaco S 5440CI

Shrinkage compensated, flowable, structural repair mortar with active corrosion inhibition

Clean all exposed reinforcement to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 2944-4. Ensure back of rebar is also clean. In case of chloride contamination of the concrete, or when depth of cover is less than 5mm the reinforcement should be protected by using **MasterEmaco P 5000AP**. Formwork must be sturdy and watertight.

## Mixing

Only full bags are mixed. Damaged or opened bags should not be used. Mix **MasterEmaco S 5440CI** in a forced action pan mixer (longer mixing time will be required in forced action or barrel mixers), or with a helical or bird cage paddle attached to a low speed (300-600rpm) mixer for 3 minutes until a lump free, fluid consistency is achieved. Only use clean water. Mixing water needed: 2.2-2.5 litres per 20kg bag depending upon consistency required.

## Priming Concrete

No special primer is required other than pre-soaking for form and pour applications. For horizontal repairs consider using **MasterEmaco P 157** or **MasterEmaco 2525** to bond the **MasterEmaco S 5440CI** to the substrate.

**MasterKure III** evaporation retarder and finishing aid can be used on larger applications and in hot dry windy exposed conditions.

## Mortar 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 **MasterEmaco S 5440CI**. The surface must be saturated surface dry, but without standing water. **MasterEmaco S 5440CI** can be poured or pumped into formwork. Leave formwork in place whilst the material sets preferably 48 hours but at least 24 hours.

## Curing

Following curing methods are advisable - polyethylene film, damp cloths, MasterKure curing agents.

## Estimating Data

One 20kg bag will yield approximately 9.7 litres of mortar. Approx. 2.2 kg of mixed product per m<sup>2</sup> per mm layer thickness (approx. 2 kg of dry powder per m<sup>2</sup> and mm layer thickness).

MasterEmaco S 5440CI				
L	Thickness in mm /m <sup>2</sup>	m <sup>3</sup>	bags /m <sup>3</sup>	m <sup>2</sup> /mm thickness
9.7	9.7mm	(0.0097)	103	9.7 m <sup>2</sup>

This consumption is theoretical and depends on the roughness of the support amount of rebar, wastage etc. It should be verified in each particular job by means of "in situ" tests.

## Packaging

**MasterEmaco S 5440CI** 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.

# MasterEmaco S 5440CI

Shrinkage compensated, flowable, structural repair mortar with active corrosion inhibition

## Disclaimer

MasterEmaco-S5440CI-ANZ-V12-0523

### STATEMENT OF RESPONSIBILITY

The technical information and application advice given in this MB Solutions Australia Pty Ltd publication are based on the present state of our best scientific and practical knowledge. As the information herein is of a general nature, no assumption can be made as to a product's suitability for a particular use or application and no warranty as to its accuracy, reliability or completeness either expressed or implied is given other than those required by law. The user is responsible for checking the suitability of products for their intended use and for ensuring that the application and use of the product is in accordance with the manufacturer's guidelines and recommendations.

### NOTE

Field service where provided does not constitute supervisory responsibility. Suggestions made by MB Solutions Australia Pty Ltd either orally or in writing may be followed, modified or rejected by the owner, engineer or contractor since they, and not MB Solutions Australia Pty Ltd, are responsible for carrying out procedures appropriate to a specific application.

#### MB Solutions Australia Pty Ltd

ABN 69 634 934 419  
 Unit 102, 2 Burbank Place  
 Norwest NSW 2153

**Freecall: 1300 227 300**

[www.master-builders-solutions.com/en-au](http://www.master-builders-solutions.com/en-au)

#### MB Solutions New Zealand Ltd

45C William Pickering Drive  
 Albany, Auckland  
 New Zealand

**Phone: +64 9 414 7233**

#### Emergency Advice:

1300 954 583 within Australia (24hr)  
 0800 001 607 within New Zealand

