

# MasterEmaco S 5410 CI

**High-strength, rapid setting, shrinkage compensated, fiber reinforced, structural repair mortar with active corrosion inhibition**

## MATERIAL DESCRIPTION

**MasterEmaco S 5410 CI** is a single component, extra high-strength, high modulus, shrinkage compensated structural repair mortar that meets the requirements of the new European Norm EN 1504 – 3 class R4.

**MasterEmaco S 5410 CI** contains Portland cement, graded sands, selected polymer fibres and special additives to significantly reduce the risk and incidence of shrinkage cracking. When mixed with water, it forms a highly thixotropic mortar that can easily be spray or trowel applied.

## RECOMMENDED USES

**MasterEmaco S 5410 CI** 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.
- Tunnels, pipes, outfalls and all below ground construction especially in harsh ground conditions.

## FEATURES AND BENEFITS

- Versatile – Can be applied in extreme environments where active corrosion inhibition is required.
- Shrinkage compensation systems and fibre reinforcement – Minimize crack tendency.
- Highly thixotropic – Can be applied up to 50 mm without the need of secondary reinforcement.
- High early and ultimate strengths – Matches high strength concrete found in structures.
- Outstanding workability – Easy placing and finishing for applicators.
- High modulus and excellent adhesion – Ensuring load transfer in structural repair.
- No primer required – Allows rapid application at reduced cost.
- Very low permeability to water and chlorides - Protection of reinforcing steel.

## TYPICAL PROPERTIES \*

Typical properties when tested at 2.8 litre water/20kg powder:

Appearance	Grey powder
Application thickness	10-50mm / layer
Overhead Max	Not more than 30mm / layer
Density	Approx. 2.2g/cm <sup>3</sup>
Mixing water per 20kg bag	Approx. 2.4 – 2.8 litres
Working time	Approx. 30 minutes
Application temperature (support and material)	Between +5 and +35°C
Compressive strength EN 1260	
• After 3 hours	≥ 15 MPa
• After 1 day	≥ 15-30 MPa
• After 7 days	≥ 40 MPa
• After 28 days	≥ 60 MPa
E-Modulus (28 days) EN 1504-3	≥ 20 GPa
Adhesion (28 days) EN 1504-3	≥ 2 MPa
Adhesion after freeze/thaw EN 1504-3	≥ 2 MPa
Adhesion after thunder/shower EN 1504-3	≥ 2 MPa
Adhesion after adhesion after dry cycling EN 1504-3	≥ 2 MPa
Capillary absorption – EN 13057	≤ 0.5 kg/m <sup>2</sup> h <sup>0.5</sup>
Rapid chloride permeability ASTM C 1202:2012	Approx. 300 coulombs (very low)

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## 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. Cut the edges of the repair vertically to a minimum depth of 10 mm. Clean all exposed reinforcement to a bright steel condition and apply **MasterEmaco 8100 AP** zinc rich primer to exposed cleaned steel and allow to dry. Ensure concrete substrate is free of dust and pre-saturated for a minimum of 4 hours prior to commencing with the installation.

### Mixing:

Only full bags are mixed. Damaged or opened bags should not be used. Mix **MasterEmaco S 5410 CI** in a forced action pan mixer, or with a helical paddle attached to a low speed (300-600rpm) mixer for 3 minutes until a lump free, plastic consistency is achieved. Only use clean water.

### Mixing water needed:

2.4 to 2.8 litres per 20kg bag depending upon consistency required. Allow the mortar to rest for 2 - 3 minutes and then remix briefly, adjusting the consistency when required, without exceeding the maximum water demand.

### Priming Concrete:

No special primer is required. Thoroughly saturate the surface of the concrete to provide a saturated surface dry condition. Poor quality concrete may require soaking for a significant length of time. Any surface water should be removed using an oil free compressed airiest.

### 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 5410 CI**. The surface must be saturated surface dry, but without

standing water. **MasterEmaco S 5410 CI** can be spray or hand applied. Apply mixed product directly to the prepared damp substrate. Spraying the material with the necessary pressure will ensure good adhesion of the material. A thin scraper coat or contact layer before building up to the required thickness, wet on wet, will improve adhesion especially in case of hand application. Apply to the desired layer thickness of 10 to max 50 mm and level using a screeding bar, trowel or wooden board. Can be applied in thicker layers in smaller patches or where additional reinforcement is present. Smoothing with a trowel or finishing by float or sponge can be done as soon as the mortar has begun to stiffen.

## CURING

The following curing methods are advised: Polyethylene film, damp cloths, MasterKure curing agents.

## ESTIMATING DATA

One 20kg bag will yield approximately 10 litres of mortar. Approx. 2.2 kg of mixed product per m<sup>2</sup> per mm layer thickness. This consumption is theoretical and depends on the roughness of the support amount of rebar, wastage etc, for which reason it should be verified in each particular job by means of "in situ" tests.

## PACKAGING

**MasterEmaco S 5410 CI** is available in 20kg bags.

## SHELF LIFE

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

## PRECAUTIONS

For the full health and safety hazard information and how to safely handle and use this product, please make sure that you obtain a copy of the Master Builders Solutions Material Safety Data Sheet (MSDS) from our office.

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## NOTE

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\* Properties listed are based on laboratory controlled tests.

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