MasterEmaco® S 5400CI

High-strength, shrinkage compensated, fibre reinforced, structural repair mortar with active corrosion inhibition

MATERIAL DESCRIPTION

MasterEmaco S 5400CI 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 5400CI** 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.

AREAS OF APPLICATION

MasterEmaco S 5400CI 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

CHARACTERISTICS AND BENEFITS

- Versatile – can be applied in extreme environments where active corrosion inhibition is required
- Shrinkage compensation systems and fibre reinforcement – minimise 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
- 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 to water and chlorides – protection of reinforcing steel
- Low chromate (Cr[VI] < 2 ppm) – low risk of skin irritation
- Chloride-free – does add to the chloride load in contaminated structures

PROPERTIES

Appearance	Grey powder
Layer thickness	Min. 5mm Max. 50mm
Density	Approx. 2.2 g/cm3
Mixing water per 20kg bag	Approx. 3.0 – 3.4 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)	 ≥16 MPa ≥ 45 MPa ≥ 70 MPa
E-Modulus (28 days) EN13412	≥ 26 GPa
Cracking tendency (I) Coutinho type ring	No cracking after 180 days
Resistivity	216000 Ω.cm
Permeability risk for Chlorides and sulphates FM5-578	Very low
AS/NZS 4020	Suitable for contact with potable water
VOC Content SCAQMD Test method 304-91	8g/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 to obtain a CSP 5 or greater profile. Cut the edges of the repair vertically to a minimum depth of 5 mm. Clean all exposed reinforcement to a minimum grade of Sa 2 according to ISO 8501-1 / ISO 12944-4. 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**.

Mixing

Only full bags are mixed. Damaged or opened bags should not be used. Mix **MasterEmaco S 5400CI** 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: 3.0 to 3.4 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.

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Priming Concrete
No special primer is required. To obtain extra strong bonding, the damp substrate can be primed with a slurry brush coat of **MasterEmaco S 5400CI** (2 parts powder to 1 part water) or **MasterEmaco P 157**. Alternatively, **MasterEmaco P 5000AP** can also be applied as the bonding slurry.

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 5400CI**. The surface must be saturated surface dry, but without standing water. **MasterEmaco S 5400CI** can be spray, trowel or hand applied. Apply mixed product directly to the prepared damp substrate, or wet in wet onto the primed surface. Spraying the material with the necessary pressure will ensure good adhesion of the material. A thin scratch 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 5mm 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
Following curing methods are advisable - polyethylene film, damp cloths, **MasterKure** curing agents.

ESTIMATING DATA
One 20kg bag will yield approximately 10.5 litres of mortar. Approx. 2.2 kg of mixed product per m^2 per mm layer thickness (approx. 2 kg of dry powder per m^2 and mm layer thickness).

MasterEmaco S 5400CI				
L	Thickness in mm /m^2	m^3	bags /m^3	m^2/mm thickness
10.5	10.5mm	(0.0105)	95	10.5 m^2

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 5400CI is available in 20kg bags.

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 copvfy of the Safety Data Sheet (SDS) from our office or website.

DISCLAIMER

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