

MasterEmaco[®] S 442

A single component, advanced repair mortar based upon applied Nanotechnology especially designed for repairs to corrosion damaged concrete

DESCRIPTION

MasterEmaco S 442 is a combination of Portland cement, well graded sands, specially selected fibres and additives formulated to reduce the possibility of shrinkage cracks, and to improve physical and application properties. When mixed with water **MasterEmaco S 442** produces a thixotropic repair mortar, suited to hand and #spray application.

TYPICAL APPLICATIONS

Refurbishment of all structural concrete elements such as:

- Oil gas and petrochemical foundations supports and retaining walls.
- Jetties piles, harbour walls and other marine structures.
- Columns, Piers and cross beams on highway structures.
- Water production, treatment, intake and outfall structures and sewerage facilities.
- Tunnels, pipes and other below ground construction.
- Cooling towers and chimneys and other industrial environments.
- Beams, columns, walls and slabs in high rise buildings.

ADVANTAGES

- Improved cement hydration reducing micro-defects, drying shrinkage, and enhancing bond using applied Nanotechnology
- Dimensional stable repairs, low permeability and enhanced durability through synergistic shrinkage control systems and best binder models
- Better physical properties, reduced early age and long term cracking tendency, by the use of EE Fibre technology
- Excellent workability for easier mixing placing and finishing

PACKAGING

MasterEmaco S 442 is available in 25 kg bags.

TYPICAL PROPERTIES*

@ 3.6 L of water / bag

Compressive strength @ 28 days BS 1881 Pt 116 1983	>70 N/mm ²
Flexural Strength @ 28 days BS EN 1015 Pt 11 BS EN 12190	>10 N/mm ²
Tensile Strength @ 28 days BS 6319 Pt 7 1985	>4 N/mm ²
Wet density	~2234 kg/m ³
EE Fibres	
Diameter	16 microns
E Modulus	>15 GPa
Density	1.18
Drying shrinkage (ASTM C157 :93)	<500 micro strain @ 28 days
Modulus of Elasticity BS 1881 Pt 121 1983 BS EN 13412-07	>35,000 N/mm ²
Water penetration BS EN 12390 Pt 8 2000	>10 mm
Rapid chloride permeability AASHTO T 277 93 ASTM C1202 : 2010	Low
Indirect tensile strength BS 1881 Pt 117 : 1983	>4.5 N/mm ²
Consistency BS EN 413 Pt2 2005	>5 mm @ 20 mins
Flow BS EN 1015 Pt 3	>140 mm @ 30 min
Determination of the adhesion to concrete by pull off test BS EN 1542	>2 N/mm ²
Determination of resistance to carbonation	<2 mm @ 60 min

APPLICATION GUIDELINES

Substrate preparation

All repair areas must be clean, sound and free from all dirt dust, loose material and any oil or grease which would impair adhesion.

Defective concrete, honeycombing and cold joints must be removed to obtain a keyed surface. The chosen method of preparation should avoid the formation of micro-cracks and fractured aggregate.

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The edges of all repairs should be cut vertically to a minimum depth of 10mm.

Reinforcing steel preparation

Where **MasterProtect 8000Cl** is specified for corrosion protection and to mitigate the 'incipient anode effect' only removal of loose corrosion products from the reinforcing steel by mechanical means is necessary prior to repair.

Where **MasterProtect 8000Cl** is not to be applied to the concrete structure and for enhanced durability where chlorides are present in the parent concrete the reinforcing steel should be primed with **MasterEmaco 8100 AP**.

Priming of the substrate

Generally priming of the substrate is not necessary however the concrete should be thoroughly soaked constantly, to a saturated but surface dry condition for a minimum of 4 hours prior to installation of the repair.

For overhead repairs where soaking with water is not practical an alternative method of priming is by the use of **MasterBrace ADH 1414** or **MasterEmaco P 210**.

Priming of reinforcement

Generally priming of the substrate is not necessary.

MIXING

It is recommended that only full bags of 25 kg are mixed.

MasterEmaco S 442 should be mixed by mechanical means. Single bags may be mixed using a slow speed drill and spiral paddle or forced action mechanical mixer.

Place the mixing water into the mixing bucket and add the **MasterEmaco S 442** powder and mix for approximately 3-5 minutes until a smooth lump free consistency is achieved.

The water additions shall be 3.1 to 3.6 L per 25kg bag. This may be reduced depending upon the consistency required.

PLACING / APPLICATION

Following mixing the **MasterEmaco S 442** can be installed by hand ensuring the initial application is scraped into the substrate to ensure good contact. The **MasterEmaco S 442** shall be compacted well into the repair area to a minimum thickness of 10mm and a maximum layer thickness of 40mm. Depending upon the geometry of the repair area **MasterEmaco S 442** may be installed in a single layer thickness greater than 40mm.

For large scale repairs **MasterEmaco S 442** can be applied by dry or wet spray techniques. Please refer to Master Builders Solutions technical department for guidance.

As soon as the **MasterEmaco S 442** starts to stiffen, finishing can be done by wooden, plastic or steel float depending upon the type of finish required.

CURING

Good curing practice must always be followed. Curing of the installed repair should be carried out by either.

- **MasterKure[®]** curing agents
- Damp Hessian and polythene

COVERAGE / YIELD

A 25kg bag of **MasterEmaco S 442** will yield approximately 12.75 L of mortar.

One bag of **MasterEmaco S 442** will cover 1.27 m² at thickness of 10mm. This coverage is theoretical and depends upon the surface profile of the substrate and the wastage.

WATCHPOINTS

- During the summer months or where elevated ambient temperatures are encountered the **MasterEmaco S 442** should be mixed using chilled water to ensure that the mixed temperature does not exceed 32°C.
- #Spray application may change the physical properties of the cured material
- Do not add cement sand, or which may affect its properties.
- Do not add water or fresh mortar to material which has begun to set.

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STORAGE AND SHELF LIFE

MasterEmaco S 442 should be stored in dry conditions out of direct sunlight. Shelf life is 12 months when stored as above.

HEALTH AND SAFETY

Avoid contact with eyes and prolonged contact with skin. In case of contact with eyes immediately flush for at least 15 minutes with fresh clean water. Call a physician.

In case of contact with skin wash skin thoroughly.

QUALITY AND CARE

All products originating from Master Builders Solutions Dubai, UAE facility are manufactured under a management system independently certified to conform to the requirements of the quality, environmental and occupational health & safety standards ISO 9001 and ISO 14001.

* Properties listed are based on laboratory controlled tests.

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