MasterEmaco® S 443

A single component, microconcrete, based upon applied Nanotechnology especially designed for cast repairs to corrosion damaged concrete

**COMPOSITION**

MasterEmaco S 443 is a combination of Portland cement, well graded sands, aggregates and special additives to reduce the possibility of shrinkage cracks and to improve physical, and installation properties

When mixed with water MasterEmaco S 443 produces a flowable micro concrete ideally suited to cast/poured applications

**TYPICAL APPLICATIONS**

Large volume repairs, to all structural elements within:

- 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.

**BENEFITS**

- Improved cement hydration, reduced micro-defects and drying shrinkage better bond using applied Nanotechnology
- Dimensional stable repairs, low permeability and enhanced durability through synergistic shrinkage control systems and best binder models
- High modulus ensuring transfer of loads to parent concrete
- Reduced installation time, easy mixing, and placing of repairs with excellent flow characteristics

**PACKAGING**

MasterEmaco S 443 is available in 25kg bags.

**TYPICAL PROPERTIES**

@ 3.25 litres of water per 25kg bag

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comp. strength @ 28 days BS EN 12190</td>
<td>&gt;65N/mm²</td>
</tr>
<tr>
<td>Flexural Strength 28 day BS EN 12190 BS EN 1015</td>
<td>&gt;10N/mm²</td>
</tr>
<tr>
<td>Drying shrinkage (ASTM C157 : 93) @ 28 days</td>
<td>&lt;750 microstrain</td>
</tr>
<tr>
<td>Modulus of Elasticity BS 1881 Part 121 1983</td>
<td>&gt;27,000N/mm²</td>
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<tr>
<td>Water penetration BS EN 12390 Part 8 2000</td>
<td>&lt;10mm</td>
</tr>
<tr>
<td>Slant shear bond strength ASTM C882</td>
<td>&gt;20N/mm²</td>
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<tr>
<td>Rapid chloride permeability AASHTO T 277 93</td>
<td>Low</td>
</tr>
<tr>
<td>ASTM C1202 : 2010</td>
<td></td>
</tr>
<tr>
<td>Determination of resistance to carbonation</td>
<td>&lt;2mm @ 60 mins</td>
</tr>
</tbody>
</table>

**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 roughened surface. The chosen method of preparation should avoid the formation of micro-cracks and fractured aggregate.

The edges of all repairs should be cut vertically to a minimum depth of 20mm.
Reinforcing steel preparation
Where MasterProtect 8000CI is to be applied to the complete structure 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 8000CI 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.

Where soaking with water is not practical an alternative method of priming is by the use of MasterBrace ADH 1414.

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

Single bags may be mixed using a slow speed drill and spiral paddle. For larger repairs and multiple bag mixes a forced action mechanical mixer should be used.

Place the gauging water into the mixing bucket and start the mixer and add the MasterEmaco S 443 powder. The MasterEmaco S 443 should be mixed for approximately 3 minutes until a smooth lump free consistency is achieved.

The water additions shall be 3.0 to 3.5 litres per 25kg bag.

In elevated temperatures the MasterEmaco S 443 should be mixed using chilled water to ensure that the mixed temperature is no higher 32°C.

Repair installation
Following mixing the MasterEmaco S 443 can be installed by shutter and casting techniques. Where large pours are necessary the MasterEmaco S 443 shall be introduced into the shuttering in layers working along the length of the formwork.

MasterEmaco S 443 is self-compacting and does not require vibration. Simply light tapping of the formwork is 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

YIELD/COVERAGE
A 25kg bag of MasterEmaco S 443 will yield approximately 12.2 litres of mortar.

One bag of MasterEmaco S 443 will cover 0.61m² at thickness of 20mm. This coverage is theoretical and depends upon the surface profile of the substrate and the wastage.

STORAGE & SHELF LIFE
MasterEmaco S 443 should be stored in dry conditions out of direct sunlight. Shelf life when stored correctly is 12 months.

WATCHPOINTS
- During summer months or where elevated ambient temperatures are encountered the MasterEmaco S 443 should be mixed using chilled water to ensure that the mixed temperature does not exceed 32°C.
- 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.
MasterEmaco® S 443

SAFETY PRECAUTIONS
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.

NOTE
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