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Maintenance of
Concrete

MasterEmaco® S 440MC

Low dust, pourable and pumpable, self-consolidating micro concrete

FORMERLY LA REPAIR MORTAR

PACKAGING

55 lb (25 kg) polyethylene-lined bags

YIELD

0.44 ft³ per 55 lb bag
(0.013 m³ per 25 kg)

STORAGE

Store in unopened containers in cool, clean, dry conditions

SHELF LIFE

12 months when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterEmaco S 440MC is a low dust one-component, shrinkage compensated micro concrete. It is designed for large volume structural repairs from 3/4" (19 mm) to full depth.

PRODUCT HIGHLIGHTS

- Dual expansion system compensates for shrinkage in plastic and hardened states
- Low-dusting for added worker comfort and safety
- High early strength allows early form removal
- Low permeability protects against carbon dioxide and chloride intrusion
- Excellent freeze/thaw resistance for durability in cold, wet environments
- Flowability makes it ideal for placement by pumping or pouring into congested locations
- Self-consolidation minimizes honeycombing without vibration
- Only requires the addition of potable water
- High bond strength for self-bonding to SSD concrete substrates

APPLICATIONS

- Interior and exterior
- Large volume structural repairs
- Repair or replacement of concrete elements
- Formed horizontal, vertical and overhead repairs

SUBSTRATES

- Concrete

HOW TO APPLY

SURFACE PREPARATION CONCRETE

1. Concrete must be structurally sound and fully cured (28 days).
2. Saw cut the perimeter of the area being repaired into a square with a minimum depth of 1/2" (13 mm).
3. Refer to current ICRI Guideline no. 310.2R for surface prep requirements to permit proper bond.

REINFORCING STEEL

1. Remove all oxidation and scale from the exposed reinforcing steel in accordance with ICRI Technical Guideline No. 310.1R.
2. For additional protection from future corrosion, coat the prepared reinforcing steel with MasterProtect P 8100 AP.

Technical Data

Composition

MasterEmaco S 440MC is a proprietary blend of cement, graded aggregate, shrinkage-compensating agents and additives.

Typical Properties

PROPERTY	VALUE
Fresh wet density , lb/ft ³ (kg/m ³) (ASTM C 138)	142 (2,275)
Set time at 70° F (21° C) , hrs, 50% relative humidity (ASTM C 191)	
Initial	6.5
Final	9

Test Data

PROPERTY	RESULTS	TEST METHOD
Slump Flow , in (cm)	29 (73.5)	ASTM C1611
Visual Stability Index	0 (Highly Stable - No Bleeding)	
J-Ring Slump Flow , in (cm)	28.5 (72.5)	ASTM C1621
Passing Ability , in (cm)	0.5 (1) No visible blocking	
Compressive strength , psi (MPa), 2" (51 mm) cubes		ASTM C 109
1 day	2,500 (17.2)	
7 days	6,000 (41.4)	
28 days	7,500 (51.7)	
Compressive strength , psi (MPa), 3 by 6" (76 by 152 mm) cylinders, at 28 days	6,700 (46.2)	ASTM C 39
Flexural strength , psi (MPa)		ASTM C 78
1 day	665 (4.6)	
7 days	1,055 (7.3)	
Slant shear bond strength¹ , psi (MPa)		ASTM C 882
1 day	750 (5.2)	
7 days	1,500 (10.3)	
28 days	2,300 (15.9)	
Tensile strength , psi (MPa), at 28 days	850 (5.9)	ASTM C 190
Splitting tensile strength , psi (MPa), at 28 days	600 (4.1)	ASTM C 496
Elastic modulus , psi (GPa)	4.2 x 10 ⁶ (29.0)	ASTM C 469
Coefficient of thermal expansion² , in/in/° F (cm/cm/° C)	5.5 x 10 ⁻⁶ (9.9 x 10 ⁻⁶)	CRD C 39
Drying shrinkage , air cured at 73° F (23° C), 50% relative humidity		Coutinho-Ring
7 days	No cracks	
28 days	No cracks	
Drying shrinkage , µstrain; 1" (25 mm) prisms, at 28 days	350	ASTM C 157 (unmodified)
Drying shrinkage , µstrain; 3" (76 mm) prisms, air cured at 73° F (23° C), 50% relative humidity		ASTM C 157 (modified)
7 days	210	
28 days	480	
Freeze/thaw resistance , % RDM3, at 300 cycles	96	ASTM C 666
Dust Reduction , % MasterEmaco S 440MC vs. Control	50%	DIN55992-2

¹No bonding agent

²Portland cement concrete; typical range is 5–10 x 10⁻⁶ in/in/° F (9–18 x 10⁻⁶ cm/cm/° C) according to the American Concrete Institute

³Relative Dynamic Modulus

Results were obtained with a water / powder ratio of 3.5 qts/55 lb (3.3 L/25 kg) bag.

All application and performance values are typical for the material, but may vary with test methods, conditions, and configurations.

MIXING

1. Precondition material to 70° F ±5° (21° C ±3°) before mixing.
2. Ensure that MasterEmaco S 440MC is thoroughly mixed; a forced-action mixer is essential. Mixing in a suitably sized container using an appropriate paddle with a slow-speed (400–500 rpm) heavy-duty drill is acceptable. Do not use free-fall mixers.
3. Measure 3 1/2 qts (3.3 L) of potable water and pour approximately 2 1/2 qts into the mixer. With the machine in operation, add 1 full 55 lb. (25 kg) bag of MasterEmaco S 440MC and mix for 1 minute before adding the rest of the water. (The powder must always be added to water.)
4. Mix for a further 2–3 minutes to obtain a smooth consistency.
5. When using the drill-and-paddle mixing method, place the complete 3 1/2 qts (3.3 L) of water in the mixing drum. With the paddle rotating, add 1 full 55 lb (25 kg) bag of MasterEmaco S 440MC and mix 3 minutes to reach a smooth, even consistency.
6. Depending on the ambient temperatures and the desired consistency, additional water may be added. The total water content should not exceed 4 qts (3.8 L) per 55 lb (25 kg) bag.

APPLICATION

1. Build forms in accordance with ACI 347R. Keep the unrestrained surface area of the repair to a minimum.
2. Saturate the prepared concrete substrate by filling the prepared formwork with clean water 24 hours before placement.
3. Immediately before the placement of MasterEmaco S 440MC, completely drain this water and seal the drainage outlets, leaving the substrate saturated surface-dry (SSD) with no ponded water remaining.
4. In jobsite circumstances where the formwork cannot be filled with water to achieve an SSD surface, the prepared concrete substrates must be thoroughly hosed down with clean water to achieve an equal level of saturation. Apply the repair material with sufficient pressure to ensure intimate contact with the substrate.
5. A long open-time bonding agent such as MasterEmaco P 124 may be used in place of a saturated substrate. In such a case, place the MasterEmaco S 440MC before the bonding agent becomes tack free.
6. Immediately after mixing, pump or pour the MasterEmaco S 440MC into the formed area. The material does not require vibrating.
7. The recommended application range of MasterEmaco S 440MC is from 40 to 85° F (4 to 29° C). Follow ACI 305 and 306 for hot or cold weather guidelines.

CURING

1. Leave the formwork in place until the compressive strength reaches 2,500 psi (17.2 MPa) or a strength specified by the engineer.
2. Cure with an approved curing compound compliant with ASTM C 309 or preferably ASTM C 1315. If the repair area will receive a coating, wet curing is recommended.

CLEAN UP

Clean tools and equipment with clean water immediately after use. Cured material must be removed mechanically.

FOR BEST PERFORMANCE

- Minimum ambient, surface, and material temperature is 40° F (4° C) and rising.
- Do not mix longer than 5 minutes.
- Do not mix partial bags.
- Minimum placement depth is 3/4" (19 mm).
- Do not use to make overlay repairs where the surface of fresh, wet MasterEmaco S 440MC will remain unrestrained during cure.
- Do not add plasticizers, accelerators, retarders, or other additives.
- Do not extend with aggregate.
- Do not vibrate.
- Do not add plasticizers, accelerators, retarders, or other additives.
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- Proper application is the responsibility of the user. Field visits by Master Builders Solutions personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

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IN CASE OF EMERGENCY: Call CHEMTEL +1 (800) 255-3924 or if outside the US or Canada, +1 (813) 248-0585.

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