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Technical Data Guide



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Maintenance of
Concrete

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MasterEmaco® S 488CI

Sprayable, fiber-reinforced structural
repair mortar with integral corrosion inhibitor

FORMERLY EMACO® S88 CI

PACKAGING

55 lb (25 kg) polyethylene-lined bags
3,300 lb (1,500 kg) bulk bags

YIELD

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

STORAGE

Store in unopened containers in a
cool, clean, dry area

SHELF LIFE

55 lb. bags: 1 year
when properly stored

3,300 lb. bulk bags: 3 months
when properly stored

VOC CONTENT

0 g/L less water and exempt solvents

DESCRIPTION

MasterEmaco S 488CI repair mortar is a one-component, shrinkage-compensated, fiber-reinforced product that contains an integral corrosion inhibitor. It can be applied vertically or overhead by low-pressure spraying or hand troweling.

PRODUCT HIGHLIGHTS

- Only requires the addition of potable water
- Achieves a tenacious bond to substrate without the need for abonding agent
- Low-pressure sprayability improves placement speed and minimizes rebound for low waste
- Sulfate-resistant and freeze/thaw durable for use in harsh environments
- Very low chloride permeability and an integral corrosion inhibitor protects reinforcing steel
- High early and ultimate compressive, flexural, and bond strengths for long-lasting, durable repairs
- Low shrinkage produces stable, durable bond
- NSF/ANSI Std 61 certified for drinking water systems

APPLICATIONS

- Interior and exterior
- Vertical and overhead
- Severe service environments such as sewer, lift stations, marine structures, and water collection

SUBSTRATES

- Concrete
- Masonry
- Brick

HOW TO APPLY

SURFACE PREPARATION

1. Substrate 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 1/4" (6 mm).
3. The surface to be repaired must be clean, free of laitance and saturated surface-dry (SSD) following ICRI Guideline no. 310.2 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.

A brand of
MBCC GROUP

Technical Data**Composition**

MasterEmaco S 488CI is a one-component rheoplastic, silica-fume modified, fiber-reinforced repair mortar with an integral corrosion inhibitor.

Compliances

- NSF/ANSI Std 61 certified for drinking water systems

Typical Properties

PROPERTY	VALUE
Unit weight, lb/ft ³ (kg/m ³)	139 (2,275)
Working time, min	45
Set times, hrs (ASTM C 266)*	
Initial set	< 4 hours
Final set	< 7 hours

Test Data

PROPERTY	RESULTS	TEST METHOD		
Modulus of elasticity, psi (GPa), at 28 days	5.0 x 10 ⁶ (34.5)	ASTM C 469		
Rapid chloride permeability, coulombs, at 28 days	Very low chloride penetrability 100–1,000 coulombs	ASTM C 1202 / AASHTO T 277		
Freeze/thaw resistance, % RDM, at 300 cycles	91.0	ASTM C 666, Procedure A		
Salt scaling resistance, 50 cycles	None	ASTM C 672		
Sulfate resistance, %, 6 months	< 0.10	ASTM C 1012		
	1 Day Psi (MPa)	7 Day Psi (MPa)	28 Day Psi (MPa)	
Direct tensile bond strength	100 (0.7)	175 (1.2)	300 (2.1)	ACI 503R, Appendix A
Direct shear bond strength	350 (2.4)	450 (3.1)	700 (4.8)	Michigan DOT
Slant shear bond strength	1,500 (10.3)	2,500 (17.2)	3,000 (20.7)	ASTM C 882, modified ¹
Splitting tensile strength	350 (2.4)	500 (3.5)	900 (6.2)	ASTM C 496
Flexural strength	650 (4.5)	1,000 (6.9)	1,300 (9.0)	ASTM C 348
Compressive strength	3,500 (24.1)	6,600 (45.5)	9,000 (62.1)	ASTM C 109
Drying shrinkage, %, at 28 days	0.09			ASTM C 157, modified ²

¹No epoxy-bonding agent used.

²ICRI Guideline No. 320.2R "Guide for Selecting and Specifying Materials for Repair of Concrete Surfaces" (formally No. 03733), 1 by 1 by 10" (25 by 25 by 250 mm) prism, air cured.

Results were obtained when material was mixed with 1 gallon (3.8 L) of water per bag and cured at 70° F (21° C). Expect reasonable variations depending upon mixing equipment, temperature, application methods, test methods, and curing conditions.

REINFORCING MESH

- In the following conditions, use a 4 by 4" (102 by 102 mm) low-gauge (10–12) mesh firmly tied into the properly prepared substrate. If repairing chloride contaminated concrete consider using galvanized or stainless mesh. Use of MasterProtect 8105/8150/8065 CP galvanic anodes or MasterProtect P 8100 AP should also be considered to protect adjacent concrete:
 - When applying MasterEmaco S 488CI mortar in repairs greater than 10 lineal feet (3 m) in the longest direction
 - In overlays at depths of 1–1½" (25–38 mm) or greater
 - For overhead applications of the same size
- Locate the mesh no closer than ⅜" (10 mm) and no more than 1" (25 mm) from the finished surface using spacers and concrete anchors.
- Mesh is not necessary in applications with side restraints, such as square-cut patches or areas where existing concrete reinforcement will provide adequate restraint. For depths over 2" (51 mm), consult your Master Builders Solutions representative.

MIXING

- Add 0.7–1.0 gallons (2.7–3.8 L) of potable water per 55 lb (25 kg) bag.
- Mechanically mix using a forced-action mortar mixer of appropriate size. Pour approximately 90% of the mix water into the mixing container, and then charge the mixer with the bagged material. Add the remaining mix water as required.
- Mix for 3–5 minutes to achieve a homogeneous consistency. For overhead applications, use a stiffer mix.

APPLICATION**HAND-TROWEL APPLICATION**

- Dampen the surface with potable water; it must be saturated surface-dry (SSD) with no standing water.
- With a gloved hand, scrub a small quantity of mixed material into the SSD substrate. Thoroughly key in and work the material throughout the cavity to promote bond. Do not apply more of the bond coat than can be covered with mortar before the bond coat dries.
- Apply material in lifts of 1/4–2" (6–51 mm). Avoid featheredging. For optimum mechanical bond on successive lifts, thoroughly score each lift and allow to reach initial set before the next layer is applied. Placement time is 45 minutes at 70° F (21° C) and 50% relative humidity.
- Trowel material to the desired finish after initial set.

- The recommended application range of MasterEmaco S 488CI is from 45 to 90° F (7 to 32° C). Follow ACI 305 and 306 for hot or cold weather guidelines.

SPRAY APPLICATION

- Spray application is recommended for larger repairs refer to ACI RAP 3.
- Applicators must have thorough knowledge of pump and spray equipment before spray-applying MasterEmaco S 488CI. Use normal techniques of pumping water first and then a cement slurry to prime and lubricate the base (neither being applied to the repair area). Be careful not to get too far ahead of the finishing crew; MasterEmaco S 488CI mortar stiffens rapidly after placement. Periodic cleaning of the pump may be helpful when applying large quantities.
- MasterEmaco S 488CI mortar may be applied on vertical or overhead surfaces in thicknesses from ⅜–2" (10 mm–51 mm). For depths over 2" (51 mm), consult your Master Builders Solutions representative. Achieve a thicker build by making multiple passes with the spray nozzle.
 - Can be applied vertically in a thickness up to 2" (51 mm) in a single lift.
 - Unless forming is used, overhead application should be no more than 11/2" (38 mm) per pass. For depths greater than 11/2" (38 mm), succeeding lifts of no more than 1" (25 mm) should be used.
 - MULTIPLE LIFTS: Timing between lifts is critical and will vary with several factors, including mix consistency, mix and ambient temperature, wind conditions, humidity, and application technique. Succeeding lifts may be placed after repair mortar has developed initial set. Roughen or profile the preliminary lifts to ensure the adhesion of subsequent lifts. When succeeding lifts will not be applied the same day, keep the surface continually moist.

FINISHING

- After placing MasterEmaco S 488CI mortar, level the surface immediately using a wooden float.
- In hot, dry, or windy conditions, use MasterKure ER 50 evaporation reducer.
- Start final finishing when the mortar has begun to set using a wooden or sponge float.

CURING

Wet cure for a minimum of seven days or cure with an approved curing compound compliant with ASTM C 309 or preferably ASTM C 1315.

CLEAN UP

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

FOR BEST PERFORMANCE

- Precondition material to approximately 70° F (21° C) for 24 hours before using.
- Protect repairs from direct sunlight, wind, and other conditions that could cause rapid drying of material.
- Do not mix partial bags.
- Minimum ambient and surface temperatures should be 45° F (7° C) and rising at the time of application.
- For professional use only; not for sale to or use by the general public.
- Make certain the most current versions of product data sheet and SDS are being used; visit www.master-builders-solutions.com/en-us to verify the most current versions.
- 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.

