

EMACO® S88 CI

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

DESCRIPTION:

EMACO® S88 CI repair mortar is a rheoplastic, shrinkage-compensated, fiber-reinforced product that contains an integral corrosion inhibitor. This one-component product is enhanced with silica fume to offer high strength and superior performance for structural concrete repair. EMACO S88 CI repair mortar is specially designed for concrete or masonry substrates and can be applied vertically or overhead by low-pressure spraying or hand troweling.

Application Thickness:

Vertical: 3/8 to 2 in. (10 to 50 mm) per lift
Overhead: 3/8 to 1-1/2 in. (10 to 40 mm) per lift

RECOMMENDED FOR:

- Vertical and overhead repair of concrete and masonry
- Bridges, parking garages and tunnels
- Piers, navigation locks, dams, sea walls and other marine structures
- Repairs in federally inspected meat and poultry plants (FDA approved)
- Manhole, wet well, sewer and lift station repairs

FEATURES/BENEFITS:

- One component, quality controlled for uniform results
- Easy to use – requires only the addition of potable water for mixing
- No additional bonding agent required
- Sprayable with low waste – virtually no rebound
- High early and ultimate compressive, flexural and bond strengths
- Sulfate-resistant and freeze-thaw durable
- Silica fume formulation for a denser matrix and extremely low permeability
- Integral corrosion inhibitor

PACKAGING/ESTIMATING:

EMACO S88 CI repair mortar is supplied in 55 lb (25 kg) moisture-resistant bags which yield approximately 0.45 ft³ (0.013 m³) of mortar. This will cover approximately 5.4 ft² (0.52 m²) at a 1 in. (25 mm) thickness before waste and rebound.

PERFORMANCE DATA:

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

PLASTIC PROPERTIES:

Unit Weight 139 lb/ft³ (2,275 kg/m³)

Working Time 45 minutes

Set Times (h:min) Initial Set 2:00 Final Set 4:00
(ASTM C 266)

HARDENED PROPERTIES:

	1 Day psi (MPa)	7 Day psi (MPa)	28 Day psi (MPa)
Direct Tensile Bond Strength (ACI 503R, Appendix A)	100 (0.7)	175 (1.2)	300 (2.1)

Direct Shear Bond Strength (Michigan DOT)	350 (2.4)	450 (3.1)	700 (4.8)
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Slant Shear Bond Strength (ASTM C 882, Modified ¹)	1500 (10.3)	2500 (17.2)	3000 (20.7)
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Drying Shrinkage at 28 Days 0.09%
(ASTM C 157, Modified²)

Modulus of Elasticity at 28 Days 5.0 x 10⁶ psi (34.5 GPa)
(ASTM C 469)

Rapid Chloride Permeability at 28 Days 772 coulombs
(ASTM C 1202/AASHTO T 277)

Freeze-Thaw Resistance at 300 Cycles 96.0% RDM
(ASTM C 666, Procedure A)

Salt Scaling Resistance, 50 Cycles None
(ASTM C 672)

Sulfate Resistance, 6 Months less than 0.10%
(ASTM C 1012)

	1 Day psi (MPa)	7 Day psi (MPa)	28 Day psi (MPa)
Splitting Tensile Strength (ASTM C 496)	350 (2.4)	500 (3.5)	900 (6.2)
Flexural Strength (ASTM C 348)	650 (4.5)	1000 (6.9)	1300 (9.0)
Compressive Strength (ASTM C 109)	3500 (24.1)	8000 (55.2)	11000 (75.9)

¹ No epoxy-bonding agent used.

² ICRI Guideline #03733, 1 in. x 1 in. x 10 in.
(25 mm x 25 mm x 250 mm) prism, air cured.

SURFACE PREPARATION:

Concrete

Perform surface preparation in compliance with ICRI Technical Guideline No. 03730 "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion". Remove all unsound or delaminated concrete providing a minimum of 1/4 in. (6 mm) substrate profile and 3/4 in. (20 mm) clearance behind corroded reinforcing steel. The perimeter of the area to be patched should sawcut to a minimum depth of 1/4 in. (6 mm) to prevent featheredges. After concrete removal and prior to placement, mechanically abrade the concrete surface to remove all bond-inhibiting materials from the concrete substrate and to provide additional mechanical bond. Presoak the prepared concrete surface to provide a saturated, surface dry (SSD) condition.

Corroded Reinforcing Steel

Remove all oxidation and scale from the exposed reinforcing steel in accordance with ICRI Technical Guideline No. 03730 "Guide to Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion". For additional protection from future corrosion, coat the prepared reinforcing steel with EMACO P22 or EMACO P24 rebar coatings.

MIXING:

Add 0.7 to 1.0 gal (2.7 to 3.8 L) of potable water per 55 lb (25 kg) bag of EMACO S88 CI repair mortar. Mechanically mix using a mortar mixer of an appropriate size. Pour approximately 90% of the mix water into the mixing container then charge the mixer with the bagged material. Add the remaining mix water as required. Mix for 3 to 5 minutes until a homogeneous consistency is achieved.

APPLICATION:

For spray applications, contact your local Master Builders representative for equipment recommendations. Remove all excess water from the saturated substrate and apply while taking proper consideration for compaction around reinforcing steel. If applying by hand, scrub a bond coat of EMACO S88 CI repair mortar into the prepared surface with a stiff bristle broom or brush. EMACO S88 CI repair mortar must be placed before the bond coat dries. When applying with multiple lifts, scratch the preliminary lift before initial set. Apply the next lift after the preliminary lift has reached final set. If the succeeding lift is not to be immediately placed, keep the surface continually moist. Cut-off or level as required matching the original concrete elevation. Where rapid drying conditions exist (such as hot, dry or windy conditions) use CONFILM® evaporation reducer. Finish the final surface as required.

CURING:

Proper curing is extremely important and should be conducted in accordance with ACI 308 "Standard Practice for Curing Concrete". Apply a curing compound that complies with the moisture retention requirements of ASTM C 309 such as MASTERKURE® 100W or 200W curing compounds; or moist cure for a minimum of 7 days.

LIMITATIONS:

Minimum application thickness is 3/8 in. (10 mm). Do not mix partial bags. Minimum ambient and surface temperatures should be 45 °F (7 °C) and rising at the time of application.

STORAGE AND SHELF LIFE:

Unopened bags have a shelf life of 18 months when stored under cover in dry conditions between 45 and 90 °F (7 and 32 °C).

RELATED BULLETINS:

Material Safety Data Sheet — EMACO S88 CI
Installation Bulletin (7I2) #112666 — EMACO S88 CI
Specification Bulletin (7S6) #112625 — EMACO S88 CI

For additional information, contact your local Master Builders representative.

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