

EMACO® S77 CI

Very flowable, shrinkage-compensated structural repair mortar with integral corrosion inhibitor

DESCRIPTION:

EMACO® S77 CI rheoplastic, flowable, form and pump repair mortar system features a unique formulation that provides excellent bond, resistance to sulfates and chlorides, high electrical resistivity, low permeability and high compressive strengths. EMACO S77 CI repair mortar provides high pumpability for structural repairs of columns and beams.

Application Thickness

- Minimum application thickness is 3/8 in. (10 mm)
- Maximum standard application thickness is 1-1/2 in. (40 mm). Deeper applications require the addition of coarse aggregate.

RECOMMENDED FOR:

- Horizontal and formed vertical and overhead repair of concrete
- Bridges, parking garages and tunnels
- Piers, navigation locks, dams, sea walls and other marine structures
- Columns and beams
- Preplaced aggregate repair

FEATURES/BENEFITS:

- Low permeability - resists water and chloride ion penetration
- Corrosion resistant - contains an integral corrosion inhibitor
- Durable - freeze-thaw and sulfate resistant
- Very flowable - excellent for form and pump/pour applications

PACKAGING/ESTIMATING:

EMACO S77 CI repair mortar is supplied in 55 lb (25 kg) moisture-resistant bags which yield approximately 0.50 ft³ (0.013 m³). This will cover approximately 6.0 ft² (0.56 m²) at a 1 in. (25 mm) depth. The product is also available in 3,300 lb (1,500 kg) bulk bags.

PERFORMANCE DATA:

Results were obtained when material was mixed with 0.96 gallons (3.6 liters) 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	135 lb/ft ³ (2,160 kg/m ³)	
Working Time	1 hour	
Set Times (h:min) (ASTM C 266)	Initial Set 2:00	Final Set 4:00

HARDENED PROPERTIES:

	1 Day psi (MPa)	7 Day psi (MPa)	28 Day psi (MPa)
Direct Tensile Bond Strength (ACI 503R, Appendix A)	300 (2.1)	400 (2.8)	550 (3.8)
Slant Shear Bond Strength (ASTM C 882 Modified ¹)	1500 (10.4)	2800 (19.3)	3100 (21.4)
Volume Change (ASTM C 806)	+0.03%	+0.05%	+0.06%
Modulus of Elasticity at 28 Days (ASTM C 469)	4.9 x 10 ⁶ psi (33.8 GPa)		
Rapid Chloride Permeability at 28 Days (ASTM C 1202/AASHTO T 277)	870 coulombs		
Freeze-Thaw Resistance at 300 Cycles (ASTM C 666)	98% RDM		
Scaling Resistance at 50 Cycles (ASTM C 672)	1, very slight scaling		
Sulfate Resistance			
Length Change at 6 Months (ASTM C 1012)	0.01		

	1 Day psi (MPa)	7 Day psi (MPa)	28 Day psi (MPa)
Splitting Tensile Strength (ASTM C 496)	350 (2.4)	600 (4.1)	950 (6.6)
Flexural Strength (ASTM C 348)	700 (4.8)	1300 (9.0)	1450 (10.0)
Compressive Strength (ASTM C 109)	3400 (23.5)	8000 (55.2)	12000 (82.8)

¹ No epoxy-bonding agent used

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 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 be sawcut to a minimum depth of 3/8 in. (10 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. Unless a bonding agent is to be used, 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 for 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 P24 rebar coatings.

MIXING:

Add 0.8 to 1.0 gallons (3.0 to 3.8 liters) of potable water per 55 lb (25 kg) bag of EMACO S77 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. For applications greater than 1-1/2 in. (40 mm) in thickness, use preplaced aggregate. Add the remaining mix water as required to obtain desired consistency. Mix for 3 to 5 minutes until a homogenous consistency is achieved.

APPLICATION:

Formed Applications

Immediately prior to placement, drain presoaking water from the form leaving a saturated substrate with no excess water remaining. For vertical and overhead applications, air relief vents should be placed at the highest point in the repair area to prevent voids from entrapped air. Apply with sufficient pressure to ensure intimate contact with the substrate surface. A long open-time bonding agent such as CONCRESE[®] LIQUID LPL bonding agent may be used in lieu of a saturated substrate. In this case, place the EMACO S77 CI repair mortar before the bonding agent becomes tack-free. Remove forms when sufficient strength has developed. For further information, consult ACI 347R "Guide to Formwork for Concrete".

Horizontal Applications

Scrub a bond coat of EMACO S77 CI repair mortar into the prepared saturated surface with a stiff bristle broom or brush. A long open time bonding agent such as CONCRESE[®] LIQUID LPL bonding agent may be used in lieu of a bond coat. EMACO S77 CI repair mortar must be placed before the bond coat or bonding agent dries. Level as needed to match the original concrete elevation. Where rapid drying conditions exist (such as hot, dry, windy conditions) use CONFILM[®] evaporation reducer. Finish the final surface as required.

CURING:

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

SAFETY:

For industrial and professional use only. Refer to MSDS before use. Wear appropriate protective clothing and eye protection.

LIMITATIONS:

Minimum application thickness is 3/8 in. (10 mm). Applications greater than 1-1/2 in. (40 mm) in thickness, the product must be extended with aggregate. 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 S77 CI
Installation Bulletin #112672 — EMACO S77 CI
Specification Bulletin #112641 — EMACO S77 CI

For additional Information, contact your local Master Builders representative.

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