

SECTION 03724
EMACO® S77-CR

VERY FLOWABLE, SHRINKAGE-COMPENSATED, STRUCTURAL REPAIR MORTAR

NOTE TO SPECIFIERS

The purpose of this suggested specification is to assist the specifier while developing a specification for the use of Master Builders *EMACO® S77-CR*. This specification has been prepared to be part of a complete project specification. It has not been prepared to be a “stand alone” item. This document is not intended to be copied directly into project specifications.

PART 1 - GENERAL

1.01 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.02 Summary

- A. This Section specifies a one-component, rheoplastic, cement based, sulfate resistant and shrinkage compensated chloride-resistant, pumpable structural repair mortar.
- B. This product is designed for repairing horizontal and formed vertical or overhead concrete structures at a minimum repair depth of 3/8 in. (10 mm) and up to 1-1/2 in.

1.03 References

ASTM C 109-90	Test Method for Compressive Strength of Hydraulic Cement Mortars - Modified.
ASTM C 348-86	Test Method for Flexural Strength of Hydraulic Cement Mortars.
ASTM C 469-87	Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
ASTM C 666-91	Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
ASTM C 806-87	Test Method for Restrained Expansion of Expansive Cement Mortar.
ASTM C 882-87	Test Method for Bond Strength of Epoxy Resin Systems used with Concrete - Modified.
ASTM C 1012-89	Test Method for Length of Change of Hydraulic Cement Mortars Exposed to a Sulfate Solution - Modified.
ASTM C 1202-91	Electrical Indication of Resistance to Chloride Ion Penetration.

1.04 System Performance Requirements

A. Provide sulfate and chloride resistant repair mortar which when cured produces the following properties:

1. Compressive Strength (ASTM C 109): Minimum, 1-day 3800 psi (26.2 MPa);
28-day 10,000 psi (68.9 MPa).
2. Flexural Strength (ASTM C 348): Minimum, 1-day 600 psi (4.1 MPa);
28-day 1000 psi (6.9 MPa).
3. Slant Shear Bond Strength:
(ASTM C 882-modified) Minimum, 1-day 1800 psi (12.4 MPa); 28-day
2500 psi (17.2 MPa).
4. Permeability (ASTM C 1202): Maximum 1000 Coulombs.
5. Restrained expansion (ASTM C 806): Minimum 0.03% at 7-days; 0.1% maximum at 28-days.
Obtain 90% of expansion within 24 hours.
6. Sulfate Resistance:
(ASTM C 1012-15 weeks) 0.1% expansion (maximum difference between control bars
in water and test bars).
7. Modulus of Elasticity (ASTM C-469): 3.1 million psi minimum, 4.8 million psi maximum.
8. Freeze Thaw Resistance:
(ASTM C-666 300 cycles) Minimum RDF 85%.

1.05 Project Conditions

- A. Weather Conditions: Apply repair mortar only when ambient and surface temperatures are 50 °F (10 °C) and rising. Do not make the repair if the ambient temperature is expected to fall below 40 °F (5 °C) within 24 hours after placement. Do not apply repair mortar when ambient and surface temperatures are 100 °F (38 °C) and above.
- B. Follow manufacturer's recommendations regarding additional installation information (hot weather-drying conditions, or cold weather installation.)

PART 2 - PRODUCTS

2.01 Materials

- A. Sulfate and Chloride-Resistant Repair Mortar: "EMACO® S77-CR" by Master Builders, Inc., a blend of portland cement, silica fume, specially graded aggregates and set-control admixtures including shrinkage compensating additives.
- B. Water: Drinkable.
- C. Curing Compounds: "MASTERKURE® CR, or MASTERKURE® 200W" by Master Builders, Inc.
- D. "CONFILM®", evaporation reducer and finishing aid, by Master Builders, Inc.

PART 3 - EXECUTION

3.01 Surface Preparation

- A. Mechanically remove unsound concrete to the limits indicated on the drawings.
- B. Remove a minimum of 3/8 in. (10 mm) of existing concrete facing and continue removal as required to expose sound aggregate. Substrate should have a minimum amplitude of 1/4 in.. Limit the size of chipping hammers to 15 lbs. to reduce micro fractures.

3.01 Surface Preparation (continued)

- C. Square cut or under cut perimeter of the area to be repaired to a minimum depth of 3/8 in. (10 mm). Do not cut existing steel reinforcement.
- D. Where reinforcing steel with active corrosion is encountered, comply with the following:
 - 1. Abrasive blast reinforcing steel to remove rust and contaminants.
 - 2. When one-half of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a 3/4 in. (90 mm) minimum depth.
 - 3. Splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by 25%, as directed by the Architect/Engineer
- E. Thoroughly clean the roughened surface and exposed reinforcement of rust, dirt, loose chips, and dust using high pressure water. Maintain substrate in a saturated, surface-dry condition.
- F. Coat exposed reinforcing steel with EMACO® P22 rebar protection prior to patching.

3.02 Mixing

- A. Comply with mortar manufacturer's recommendations for water quantity and mixing procedures.

3.03 Application

- A. Place flowable sulfate and chloride-resistant repair mortar by pouring or pumping with a minimum application thickness of 3/8 in. (10 mm).

3.04 Finishing

- A. Level surface of repair mortar using a float or screed.
- B. Apply final finish when mortar has begun to stiffen.

3.05 Curing

- A. Protect fresh mortar from premature evaporation. Cure finished repair mortar by one of the following methods:
 - 1. Preferred Method: Keep area continuously moist with water as soon as mortar surface has hardened (thumb print hard), for a minimum of seven days.
 - 2. Acceptable Method: Apply two coats of curing compound, Master Builders "MASTERKURE® CR, or MASTERKURE® 200W". Apply the first coat immediately after completing finishing operations. Apply the second coat 24 hours later.

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