



DIVISION 3 - CONCRETE
Section 03730 - Concrete Rehabilitation

Part 1 – General

1.01 Summary

- A. This specification describes the patching of interior and/or exterior vertical or overhead surfaces with a polymer-modified, portland cement mortar.

1.02 Quality Assurance

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (5°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 Submittals

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 Warranty

- A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturer

- A. **SikaTop 123 Plus**, as manufactured by Sika Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

- A. Polymer-modified Portland cement mortar:
 - 1. Component A shall be a liquid polymer emulsion of an acrylic copolymer base and additives.
 - a. pH: 4.5-6.5
 - b. Film Forming Temperature: 73°F max.
 - c. Tear Strength: 950-psi min.
 - d. Elongation at Break: 500% min.
 - e. Particle Size: less than 0.1 micron
 - 2. Component A shall contain an organic, penetrating corrosion inhibitor which has been independently proven to reduce corrosion in concrete via ASTM G3 (half-cell potential tests). The corrosion inhibitor shall not be calcium nitrite, and shall have a minimum of 5 years of independent field testing to document performance on actual construction projects.
 - 3. Component B shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
 - 4. The materials shall be non-combustible, both before and after cure.
 - 5. The materials shall be supplied in a factory-proportioned unit.
 - 6. The polymer-modified, portland cement mortar must be placeable from 1/8" to 1-1/2" in depth per lift for vertical applications and 1/8" to 1" in depth for overhead applications.

2.03 Performance Criteria

- A. Typical Properties of the mixed polymer-modified, portland cement mortar:
 - 1. Working Time: Approximately 15 minutes
 - 2. Finishing Time: 20 - 60 minutes
 - 3. Color: concrete gray
- B. Typical Properties of the cured polymer-modified, portland cement mortar:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 3500 psi min. (24.1 MPa)
 - b. 7 day: 6000 psi min. (44.8 MPa)
 - c. 28 day: 7000 psi min. (48.3 MPa)
 - 2. Flexural Strength (ASTM C-293) @ 28 days: 2000 psi (13.8 MPa)
 - 3. Splitting Tensile Strength (ASTM C-496) @ 28 days: 900 psi (6.2 MPa)
 - 4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2200 psi (15.2 MPa)
 - 5. The portland cement mortar shall not produce a vapor barrier.
 - 6. Density (wet mix): 132 lbs. / cu. ft. (2.2 kg/l)
 - 7. Permeability - AASHTO T-277 @ 28 days Approximately 500 Coulombs

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

Part 3 – Execution

3.01 Surface Preparation

- A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/8" in depth.
- B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika Armatec 110 EpoCem as per the technical data sheet. (See Spec Component SC-201-0699)

3.02 Mixing and Application

- A. Mechanically mix in an appropriate sized mortar mixer or with a Sika mud paddle and low speed (400-600 rpm) drill. Pour approximately 4/5 gal Component A into the mixing container. Add Component B while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add remaining Component A to mix for desired consistency. Should smaller quantities be needed, be sure the components are measured in the correct ratio and that the Component B is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 10 - 15 minutes. Do not retemper material.
- B. Placement Procedure: At the time of application, the substrate shall be saturated surface dry with no standing water. Mortar must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat. (See spec component SC-200-0699) After filling, consolidate then screed. Allow mortar to set to desired stiffness then finish with trowel for smooth surface. Wood float or sponge float for a rough surface. Areas where the depth of the repair area to sound concrete is greater than 1-1/2", the repair shall be made in lifts of 1-1/2" maximum thickness. The top surface of each lift shall be scored to produce a rough surface for the next lift. The preceding lift shall be allowed to reach final set before applying fresh material. The fresh mortar must be scrubbed into the preceding lift.
- D. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing and continue for 48 hours. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

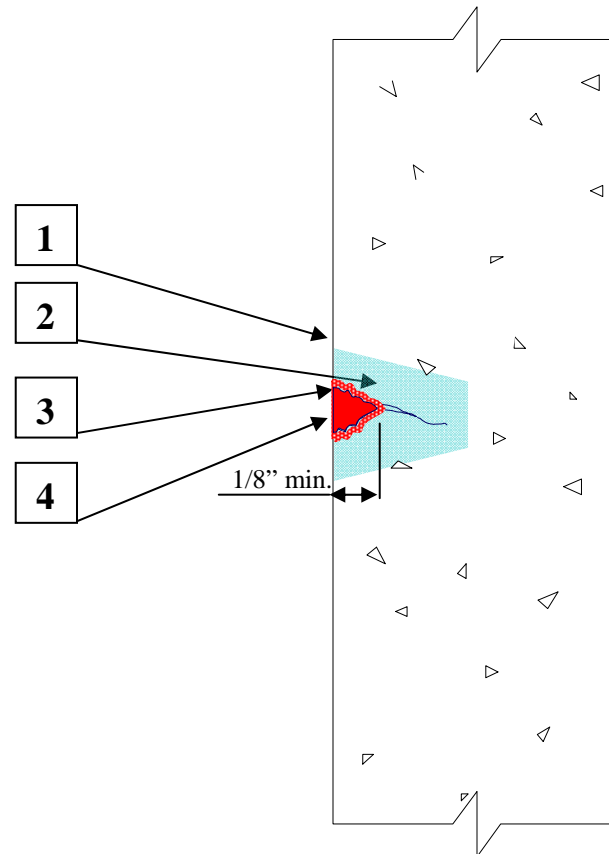
*Pretesting of curing compound is recommended.
- E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

3.05 Cleaning

- A. The uncured polymer-modified portland cement mortar can be cleaned from tools with water. The cured polymer - modified portland cement mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-027

SikaTop[®] 123 Plus Crack Filler (Vertical / Overhead)

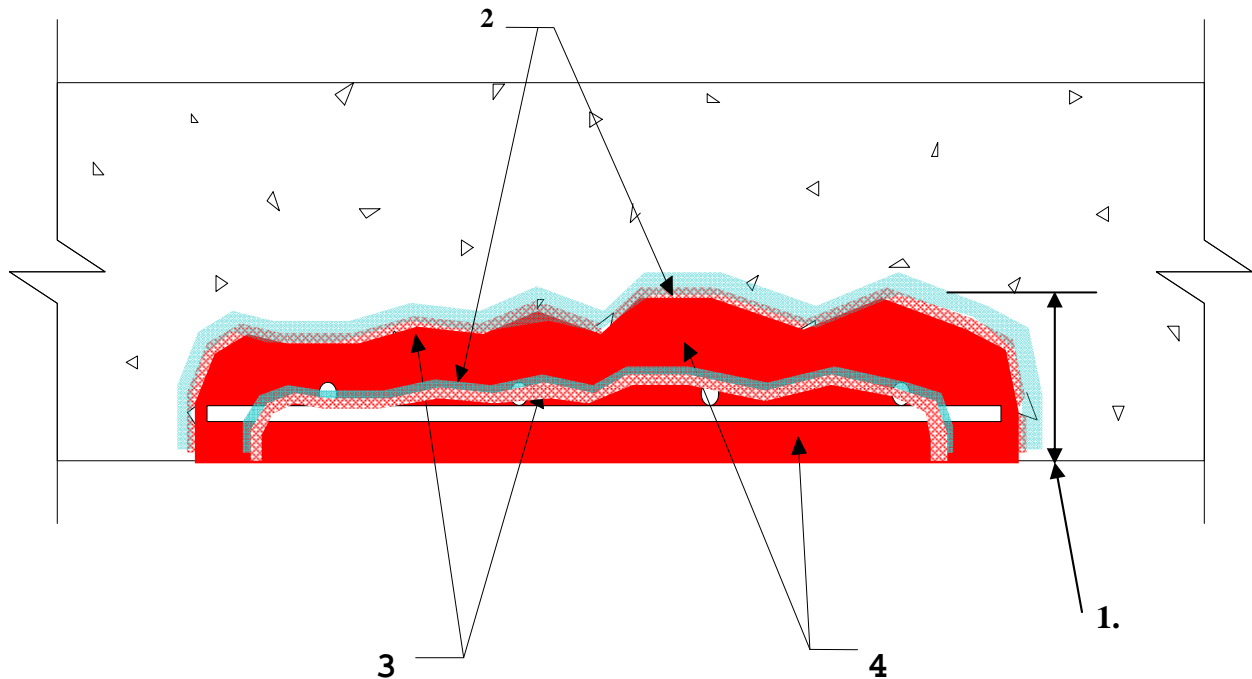


1. Substrate shall be clean, sound and lattinance-free prior to repairing.
2. Pre-soak the substrate to provide saturated surface dry (SSD) condition prior to applying repair material. (Exception: not applicable if Sikadur 32 Hi-Mod or Sikadur Patch-Fix is used as an epoxy agent)
3. Apply scrub coat of the repair material to the prepared substrate. (Exception: not applicable if Sikadur 32 Hi-Mod or Sikadur Patch-Fix is used as an epoxy agent)
4. While scrub coat is wet place SikaTop 122 *Plus*, filling the entire cavity. Strike off and finish as required. Wet cure or use Sikagard Curing Compound and protect as per the technical data sheet.

Concrete Restoration Systems by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071

SC-027 SikaTop® 123 Plus

Hand-applied (Vertical / Overhead)



1. Repair area should not be less than $\frac{1}{8}$ " in depth.
2. Substrate should be saturated surface dry (SSD) with no standing water during application. (Exception: not applicable with Sikadur 32 Hi-Mod or Sikadur Patch-Fix as an epoxy bonding agent)
3. Apply scrub coat to the substrate, filling all pores and voids. (Exception: not applicable with Sikadur 32 Hi-Mod or Sikadur Patch-Fix as an epoxy bonding agent)
4. While scrub coat (or epoxy bonding agent) is still wet apply **SikaTop 123 Plus**.

Note: If repair area is too large to fill while scrub coat is still wet, use Sika Armatec 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)

For applications greater than 1- $\frac{1}{2}$ " in depth, apply **SikaTop 123 Plus** in lifts. Score the top surface of each lift to produce a roughened surface for the next lift. Allow preceding lift to reach final set. Repeat from step 3.

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