
SikaTop 123 Plus



Spec Component: SC-027-03/10
SikaTop 123 Plus

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.

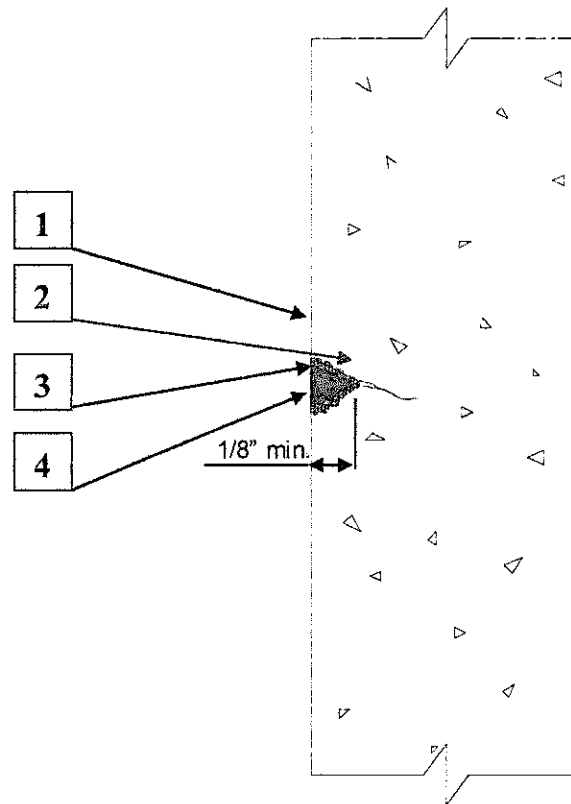
*Pretesting of curing compound is recommended.
- E. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed technical data sheet and literature.

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)

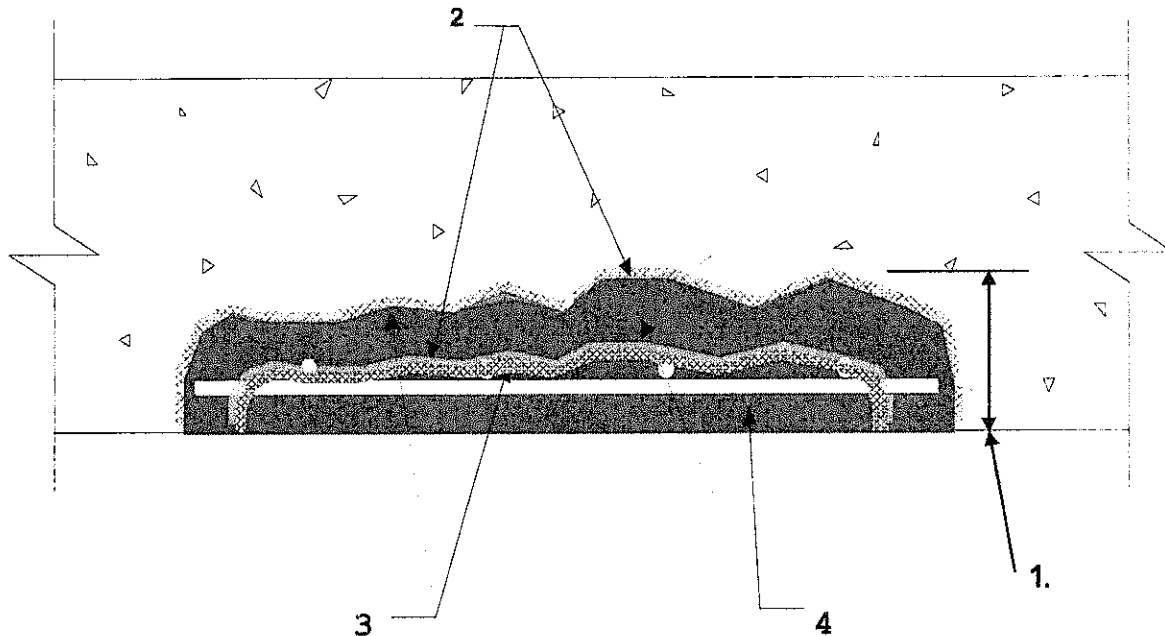


1. Substrate shall be clean, sound and lamination-free prior to repairing.
2. Pre-soak the substrate to provide saturated surface dry (SSD) condition prior to applying repair material. (Exception: not applicable if Sikadur 32 Hi-Mod or Sikadur Patch-Fix is used as an epoxy agent)
3. Apply scrub coat 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 Armatex 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)

For applications greater than 1-½" 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.

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

The preceding specifications are provided by Sika Corporation as a guide for informational purposes only and are not intended to replace sound engineering practice and judgment and should not be relied upon for that purpose. **SIKA CORPORATION MAKES NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS OR THE CONTENTS OF THESE GUIDE SPECIFICATIONS.** Sika Corporation assumes no liability with respect to the provision or use of these guide specifications, nor shall any legal relationship be created by, or arise from, the provision of such specifications. **SIKA SHALL NOT BE RESPONSIBLE UNDER ANY LEGAL THEORY TO ANY THIRD**

PARTY FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING FROM THE USE OF THESE GUIDE SPECIFICATIONS. The specifier, architect, engineer or design professional or contractor for a particular project bears the sole responsibility for the preparation and approval of the specifications and determining their suitability for a particular project or application.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Technical Data Sheet, product label and Material Safety Data Sheet which are available at www.sikaconstruction.com or by calling (201) 933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Technical Data Sheet, product label and Material Safety Data Sheet prior to product use.

Sika Armatec 110 EpoCem



Spec Component: SC-201-03/10
Sika Armatec 110 EpoCem

DIVISION 9 - FINISHES
Section 09800 - SPECIAL COATINGS
Section 09870 - Coating Systems for Steel

Part 1 - General

1.01 Summary

- A. This specification describes the use of a 3-component, epoxy-modified, cementitious, anti-corrosion coating for reinforcing steel in concrete restoration.

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 40°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 coating.

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 Manufacturers

- A. **Sika Armattec 110 EpoCem**, as manufactured by Sika Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

- A. Epoxy resin/portland cement adhesive shall be **Sika Armattec 110 EpoCem**
1. Component "A" shall be an epoxy resin/water emulsion containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
 2. Component "B" shall be primarily a water solution of a polyamine.
 3. Component "C" shall be a blend of selected portland cements and sands.
 4. The material shall not contain asbestos.

2.03 Performance Criteria

- A. Properties of the mixed epoxy resin/portland cement adhesive.
1. Pot Life: 90 minutes @ 73° F
 2. Contact Time: 95°F (35°C) 6 hours
80-95F (26-35C) 6 Hours
65-79F (18-26C) 12 Hours
50-64F (10-17C) 16 Hours
40-49F (4-9C) wet on wet
 3. Color: dark gray
- B. Properties of the cured epoxy resin/portland cement adhesive.
1. Compressive Strength (ASTM C-109)
 - a. 3 day: 4500 psi (31.0 MPa)
 - b. 7 day: 6500 psi (44.8 MPa)
 - c. 28 day: 8500 psi (58.6 MPa)
 2. Splitting Tensile Strength (ASTM C-496)
 - a. 28 days: 600 psi (4.1 MPa)
 3. Flexural Strength (ASTM C-348)
 - a. 1250 psi (8.6 MPa)
 4. Bond Strength ASTM C-882 at 14 days
 - a. Wet on Wet, 0-hr. open time: 2800 psi (19.3 MPa)
 - b. 24-hr. open time: 2600 psi (17.9 MPa)
 5. Bond of Steel Reinforcement to Concrete (Pullout Test)
 - a. **Sika Armattec 110 EpoCem** coated 625-psi (4.3 MPa)
 - b. Epoxy coated 508 psi (3.5 MPa)
 - c. Plain Reinforcement 573 psi (3.95 Mpa)
 6. The epoxy resin/portland cement adhesive shall not produce a vapor barrier.
 7. Material must be proven to prevent corrosion of reinforcing steel when tested under the procedures as set forth by the Federal Highway Administration Program Report No. FHWA/RD86/193. Proof shall be in the form of an independent testing laboratory corrosion report showing prevention of corrosion of the reinforcing steel.

Note: Tests above were performed with material and curing conditions at 73°F and 45-55% relative humidity.

Part 3 - Execution

3.01 Mixing and Application

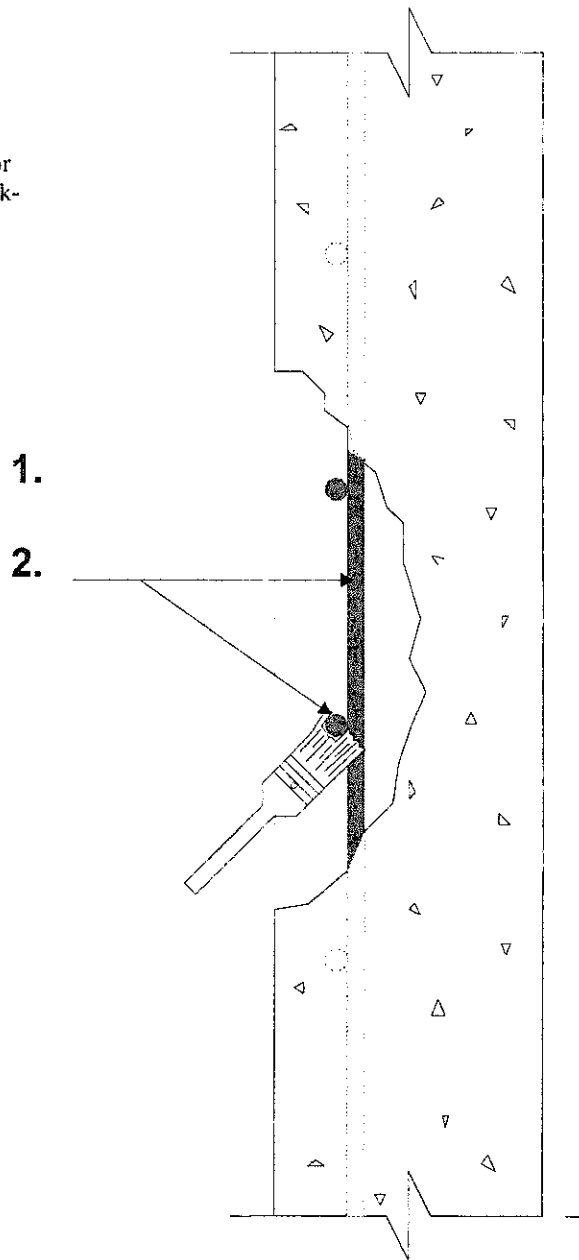
- A. Mixing the epoxy resin: Shake contents of Components "A" and Component "B". Completely empty both components into a clean, dry mixing pail. Mix thoroughly for 30 seconds using a jiffy paddle with a low-speed (400-600 rpm) drill. Slowly add the entire contents of Component "C" while continuing to mix for 3 minutes until uniform with no lumps. Mix only that quantity that can be applied within its pot life.
- B. Placement procedure:
 - 1. Apply to prepared steel surface with a stiff-bristle brush, or "hopper type" spray equipment at 20 mils minimum thickness. Properly coat the underside of the totally exposed steel. Allow to dry (approx. 2 - 3 hours) then apply a second coat at 20 mils minimum thickness. Allow drying again before placing repair mortar.
- C. Adhere to all limitations and cautions for the epoxy resin/portland cement adhesive in the manufacturers current printed literature.

3.02 Cleaning

- A. The uncured epoxy resin/portland cement adhesive can be cleaned from tools with water. The cured epoxy resin/portland cement adhesive 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-201 Sika® Armatec 110 EpoCem Anti-corrosion

1. Apply Sika Armatec 110 EpoCem with stiff bristle brush or spray 20 mils thick, covering all exposed steel. Cure to tack-free 2-3 hours.
2. Apply a second coat at 20 mils. Allow to dry again before applying repair mortar or concrete.



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

The preceding specifications are provided by Sika Corporation as a guide for informational purposes only and are not intended to replace sound engineering practice and judgment and should not be relied upon for that purpose. **SIKA CORPORATION MAKES NO WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS OR THE CONTENTS OF THESE GUIDE SPECIFICATIONS.**

Sika Corporation assumes no liability with respect to the provision or use of these guide specifications, nor shall any legal relationship be created by, or arise from, the provision of such specifications **SIKA SHALL NOT BE RESPONSIBLE UNDER ANY LEGAL THEORY TO ANY THIRD PARTY FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING FROM THE USE OF THESE GUIDE SPECIFICATIONS.** The specifier, architect, engineer or design professional or contractor for a particular project bears the sole responsibility for the preparation and approval of the specifications and determining their suitability for a particular project or application.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Technical Data Sheet, product label and Material Safety Data Sheet which are available at www.sikaconstruction.com or by calling (201) 933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Technical Data Sheet, product label and Material Safety Data Sheet prior to product use.