



Division 3 - Concrete
Section 03930 - Concrete Rehabilitation

Part 1 - General

1.01 Summary

- A. This specification describes the patching of exterior above and below grade vertical and overhead surfaces with an epoxy resin adhesive binder.

1.02 Quality Assurance

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001/9002 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 the 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 product.

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. Sikadur 23, Lo-Mod Gel, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for patching for a minimum of one year..

2.02 Materials

- A. Epoxy resin adhesive binder:
 - 1. Component "A" shall be a modified epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
 - 2. Component "B" shall be a blend of aliphatic amines containing suitable viscosity control agents, pigments and accelerators.
 - 3. The ratio of Component "A": Component "B" shall be 1:1 by volume.
 - 4. The material shall not contain asbestos.

2.03 Performance Criteria

- A. Properties of the mixed epoxy resin adhesive:
 - 1. Pot Life: 45 minutes (200 gram mass)
 - 2. Tack-Free Time to Touch (20 mil thickness): 1.5-2.5 hours
 - 3. Consistency (½ in. thick) : non-sag
 - 4. Color: gray
- B. Properties of the mixed epoxy resin adhesive:
 - 1. Compressive Properties (ASTM D-695) at 28 days
 - a. Compressive Strength: 5,150 psi (35.5 MPa)
 - b. Compressive Modulus : 128,000 psi 883 MPa)
 - 2. Tensile Properties (ASTM D-638) at 14 days
 - a. Tensile Strength: 2,000 psi (13.8 MPa)
 - b. Elongation at Break: 6.3%
 - c. Modulus of Elasticity: 323,000 psi (2,227 MPa)
 - 3. Flexural Properties (ASTM D-790) at 14 days
 - a. Flexural Strength (Modulus of Rupture): 4,800 psi (33MPa)
 - b. Tangent Modulus of Elasticity in Bending: 471,000 psi (3,247 MPa)
 - 4. Shear Strength (ASTM D-732) at 14 days: 3,000 psi (21MPa)
 - 5. Total Water Absorption (ASTM D-570) at 7 days: (2 hour boil) 0.4%
 - 6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
 - a. 2 day (Dry cure): 2,600 psi (17.9 MPa)
 - b. 14 day (moist cure): 1,700 psi (11.7 MPa)
 - 7. Deflection Temperature (ASTM D-648) at 14 days: 102F (fiber stress loading = 66 psi)
 - 8. The epoxy resin adhesive binder shall be approved by the United States Department of Agriculture.
- C. Properties of the epoxy resin mortar (epoxy resin/aggregate* =1/1 by loose volume):
 - 1. Compressive Properties (ASTM D-695) at 28 days
 - a. Compressive Strength: 7,200 psi (49.6 MPa)
 - b. Compressive Modulus: 400,000 psi (2,758 MPa)

2. Tensile Properties (ASTM D-638) at 14 days
 - a. Tensile Strength: 2,400 psi (16.5MPa)
 - b. Elongation at Break: 1%
 - c. Modulus of Elasticity: 610,000 psi (4,206 MPa)
3. Flexural Properties (ASTM D-790) at 14 days
 - a. Flexural Strength (Modulus of Rupture): 3,900 psi (26.9 MPa)
 - b. Tangent Modulus of Elasticity in Bending: 680,000 psi (4,688 MPa)
4. Shear Strength (ASTM D-732) at days: 3,300 psi (22.7 MPa)

* Aggregate used shall conform to ASTM C-190.

Part 3 – Execution

3.01 Mixing and Application

- A. Mixing the epoxy resin adhesive: Premix each component. Proportion equal parts by volume of Component “A” and Component “B” into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (45-65 minutes at 73 F).
- B. Mixing the epoxy resin mortar: Slowly add 1 part by loose volume of an oven-dried sand to 1 part by volume of the mixed epoxy resin adhesive binder. Continue mixing with the drill and paddle until the sand is uniformly blended.
- C. Placement Procedure: Work the epoxy resin mortar against the side walls of the prepared area, slowly working to the center and finally filling the whole cavity to excess. Strike off and level with a screed. Smooth with a finishing trowel. Occasionally wipe the trowel with a rag dampened with water.
- D. Adhere to all limitations and cautions for the epoxy resin adhesive in the manufacturers current printed literature.

3.05 Cleaning

- A. The uncured epoxy resin adhesive can be cleaned from tools with an approved solvent. The cured epoxy resin 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.

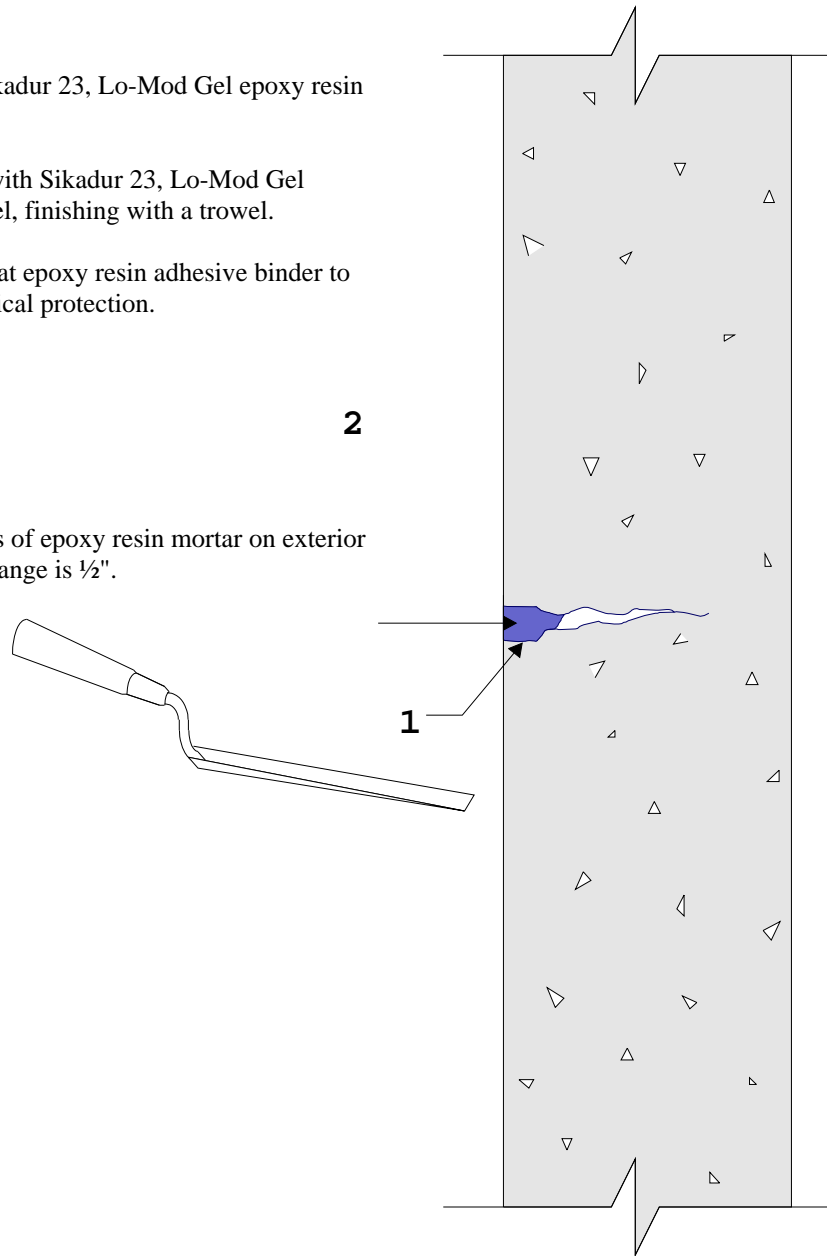
Note: Tests above were performed with material and curing conditions at 71-75 F and 45-55% relative humidity .

SC-039

Sikadur[®] 23, Lo-Mod Gel Crack Filler (Vertical / Overhead)

1. Prime prepared substrate with neat Sikadur 23, Lo-Mod Gel epoxy resin adhesive binder.
2. While primer is still tacky fill cavity with Sikadur 23, Lo-Mod Gel epoxy resin mortar. Strike off and level, finishing with a trowel.
3. Seal cured epoxy resin mortar with neat epoxy resin adhesive binder to provide additional moisture and chemical protection.

Note: Maximum application thickness of epoxy resin mortar on exterior substrates subject to thermal change is ½".



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