

DIVISION 3 - CONCRETE
Section - 03550 Concrete Toppings
03920 Concrete Resurfacing
03930 Concrete Rehabilitation

Part 1 – General

1.01 Summary

- A. This specification describes the patching or overlay of exterior above & below grade horizontal 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 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 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. **Sikadur 21 Lo-Mod LV**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio 43302 is considered to conform to the requirements of this specification.

2.02 Materials

- A. Epoxy resin adhesive binder:
 - 1. Component "A" shall be a modified epoxy resin of the diglycidether bisphenol A Type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
 - 2. Component "B": shall be primarily a reaction product of a selected amine blend with an epoxy resin of the diglycidether bisphenol A Type containing suitable viscosity control agents, pigments, and accelerators.
 - 3. The ratio of Component "A": Component "B" shall be 1:1 by volume.
- B. Aggregate for the epoxy resin mortar shall be an oven-dried, 20-40 gradation sand, as approved by the Engineer.

2.03 Performance Criteria

- A. Typical Properties of the mixed epoxy resin adhesive binder:
 - 1. Pot life: 20-30 minutes (200 gram mass)
 - 2. Tack-free time to touch (20 mil thickness at 73F): 2.5-3.5 hours
 - 4. Color: clear, amber
- B. Typical Properties of the mixed neat cured epoxy resin adhesive binder:
 - 1. Compressive Properties (ASTM D-695) at 28 days
 - a. Compressive Strength: 9,200 psi min (63.4 MPa)
 - b. Compressive Modulus: 258,000 psi (1,724.1 Mpa)
 - 2. Tensile Properties: (ASTM D-638) at 14 days
 - a. Tensile Strength: 5,800 psi min (40 MPa)
 - b. Elongation at Break: 5.5%
 - c. Modulus of Elasticity: 143,000 psi (986.2 Mpa)
 - 3. Flexural Properties: (ASTM D-790) at 14 days
 - a. Flexural Strength (Modulus of Rupture): 9,600 psi min (66.2 MPa)
 - b. Tangent Modulus of Elasticity in Bending: 298,000 psi (2,055 Mpa)
 - 4. Shear Strength (ASTM D-732) at 14 days: 5,670 psi min (35.8 MPa)
 - 5. Total water absorption (ASTM D-570) at 7 days: 0.26% max. (2 hour boil)
 - 6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
 - a. 2 days (dry cure): 1,100 psi min (7.5 MPa)
 - b. 14 days (moist cure): 1,600 psi min (11 MPa)
- C. Typical Properties of the mixed cured epoxy resin mortar (epoxy resin/aggregate 1/6 by loose volume)
 - 1. Compressive Properties (ASTM C-579) at 28 days
 - a. Compressive Strength: 6,100 psi (42 MPa)
 - b. Compressive Modulus: 760,000 psi (5,240 Mpa)

2. Tensile Properties (ASTM D-638) at 14 days
 - a. Tensile Strength: 1,300 psi (8.9 MPa)
 - b. Elongation at Break: 0.2%
 - c. Modulus of Elasticity: 660,000 psi (4,551 Mpa)
3. Flexural Properties (ASTM D-790) at 14 days
 - a. Flexural Strength (Modulus of Rupture): 2,300 psi (15.8 MPa)
 - b. Tangent Modulus of Elasticity in Bending: 1,200,000 psi (8,274 Mpa)
4. Shear Strength (ASTM D-732) at 14 day: 2,000 psi (13.7 MPa)
5. Deflection Temperature (ASTM D-648) at 14 days: 111F(44°C) (fiber stress loading = 66 psi)
6. Abrasion (Taber Abrader) Mortar 1:6 at 14 days
 - a. Weight loss: 4.1 gm (H-22 wheel, 1,000 gm weight / 1,000 cycles)

* Aggregate used shall conform to ASTM C-190.

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 the concrete substrate to obtain a surface profile of +/- 1/16” (CSP 4 or greater as per ICRI Guidelines) with a new exposed aggregate surface.
- B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust.

3.02 Mixing and Application

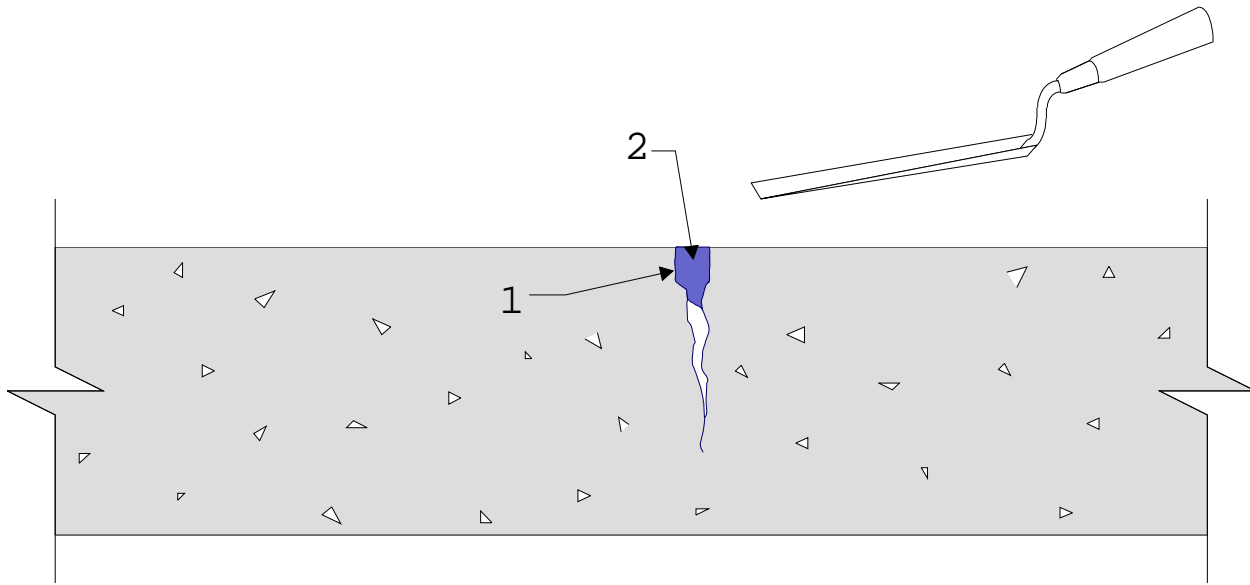
- A. Mixing the epoxy resin adhesive binder: Proportion equal parts by volume of Component “A” and Component “B” into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (20-30 minutes at 73F).
- B. Mixing the epoxy resin mortar: Slowly add 6 parts 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. Mixing can also be accomplished with a clean, dry portland cement mortar mixer by adding the sand to the pre-mixed epoxy resin adhesive binder.
- C. Placement Procedure: Prime the prepared substrate with the mixed epoxy resin adhesive binder with brushes, rollers, or brooms. Do not over prime or puddle. Coverage should be approximately 400 sq ft/gal min.
- D. Apply the epoxy resin mortar while the primer is still tacky. For patching, work the mortar against the side walls of the area to be repaired, slowly working to the center and finally filling the whole cavity to excess. Strike off and level with a screed. Finish with a finishing trowel. Occasionally wipe the trowel with a rag dampened with water. For an overlay, use permanent or temporary screeds or hand trowel to gage thickness. Strike off and level with screed. Finish with a finishing trowel.
- E. Apply a seal coat of the neat epoxy resin adhesive binder to the cured epoxy resin mortar. A seal coat is highly recommended in high moisture and chemical environments.
- F. Adhere to all limitations and cautions for the epoxy resin adhesive binder in the manufacturers current printed literature.

3.03 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.

SC-013

Sikadur 21, Lo-Mod LV Crack Filler (Horizontal)



1. Prime prepared substrate with neat Sikadur 21 Lo-Mod LV epoxy resin adhesive binder.
2. While primer is still tacky fill cavity with Sikadur 21 Lo-Mod LV 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 not to exceed ½" per lift.

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