



**Division 3- Concrete**  
**Section 03930 - Concrete Rehabilitation**

Part 1 - General

**1.01 Summary**

This specification describes the patching of interior 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 Manufacturers

- A. Sikadur 31, Hi-Mod Gel, 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 epichlorohydrin bisphenol A type containing suitable viscosity control agents and pigments. 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 epichlorohydrin 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. Properties of the mixed epoxy resin adhesive:
  - 1. Pot Life: 60 minutes (500 gram mass) @73F
  - 2. Tack-Free Time to Touch (30 mil thickness): 1.5 – 2.5 hours
  - 3. Consistency: non-sag paste
  - 4. Color: Concrete gray
- B. Properties of the mixed epoxy resin adhesive:
  - 1. Compressive Properties (ASTM D-695) at 28 days
    - a. Compressive Strength: 16,000 psi (110.3 MPa)
    - b. Compressive Modulus: 795,000 psi (5,485 MPa)
  - 2. Tensile Properties (ASTM D-638) at 7 days
    - a. Tensile Strength: 3,300 psi (22.7 MPa)
    - b. Elongation at Break: 0.9%
  - 3. Flexural Properties (ASTM D-790) at 14 days
    - a. Flexural Strength (Modulus of Rupture): 6,100 psi (42 MPa)
    - b. Tangent Modulus of Elasticity in Bending:  $1.67 \times 10^6$  psi (11,520 MPa)
  - 4. Shear Strength (ASTM D-732) at 14 days: 4,600 psi (31.7 MPa)
  - 5. Total Water Absorption (ASTM D-570) at 7 days: 0.79% (2 hour boil)
  - 6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
    - a. 14 day (moist cure): 2,900 psi ( 20 MPa)
  - 7. Deflection Temperature (ASTM D-648) at 7 days: 135F (fiber stress loading = 264 psi)
  - 8. The epoxy resin adhesive binder shall be approved by the United States Department of Agriculture.

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

## Part 3 – Execution

### 3.01 Mixing and Application

- A. Mixing the epoxy resin adhesive binder: Premix each component. Proportional 2 parts Component “A” to 1 part Component “B” by volume 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 (25-45 minutes at 73F).
- 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.

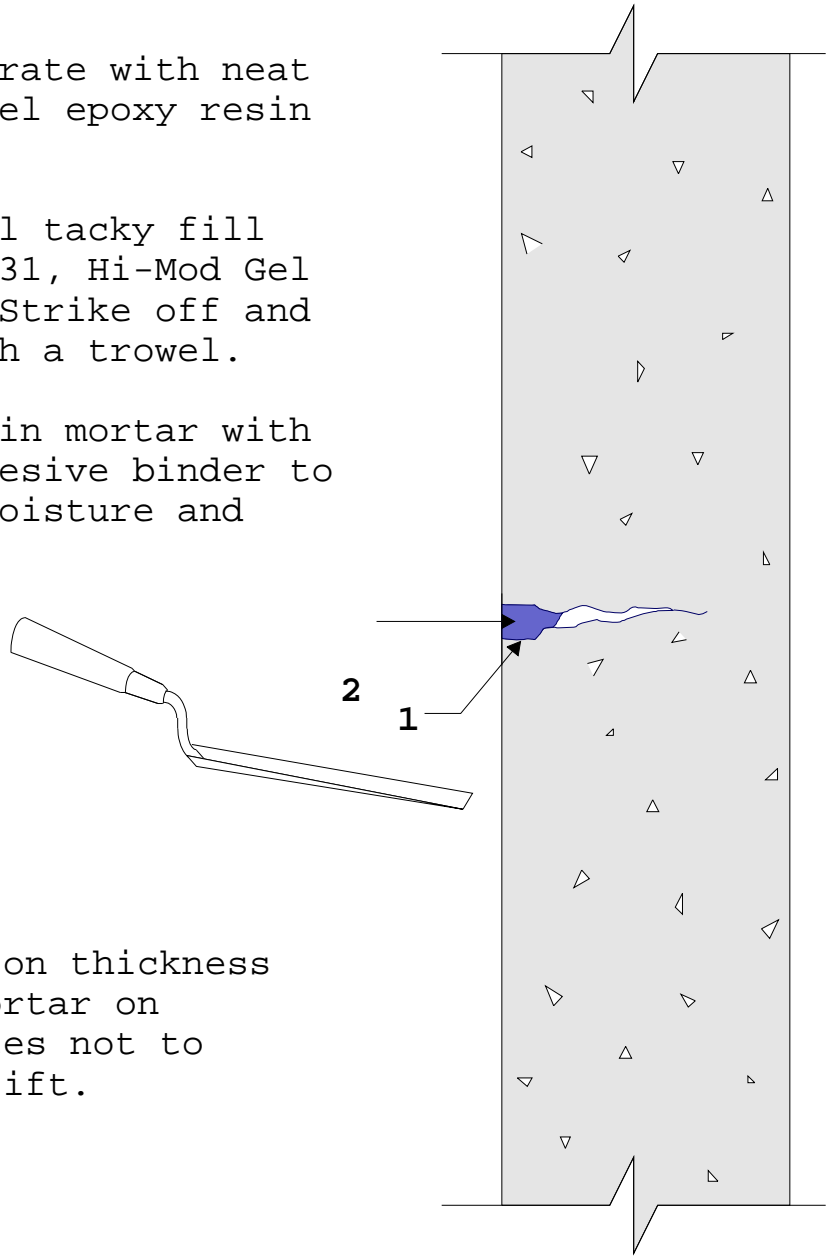
### 3.02 Cleaning

- 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-041

## Sikadur® 31, Hi-Mod Gel Crack Filler (Vertical / Overhead)

1. Prime prepared substrate with neat Sikadur 31, Hi-Mod Gel epoxy resin adhesive binder.
2. While primer is still tacky fill cavity with Sikadur 31, Hi-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 not to exceed 1 ½" per lift.

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