SikaTop® 122 PLUS
Two-component, polymer-modified, cementitious, trowel-grade mortar plus FerroGard 901 penetrating corrosion inhibitor

Description
SikaTop 122 PLUS is a two-component, polymer-modified, portland-cement, fast-setting, trowel-grade mortar. It is a high performance repair mortar for horizontal and vertical surfaces and offers the additional benefit of FerroGard 901, a penetrating corrosion inhibitor.

Where to Use
- On grade, above, and below grade on concrete and mortar.
- On horizontal surfaces.
- As a structural repair material for parking structures, industrial plants, walkways, bridges, tunnels, dams, and ramps.
- To level concrete surfaces.
- As an overlay system for topping/resurfacing concrete.
- Overlay in cathodic protection systems.

Advantages
- High compressive and flexural strengths.
- High early strengths. Opens to traffic fast: foot in 4-6 hours, pneumatic tire in 8-12 hours.
- High abrasion resistance.
- Increased freeze/thaw durability and resistance to deicing salts.
- Compliant with coefficient of thermal expansion of concrete - Passes ASTM C-884 (modified).
- Increased density - improved carbon dioxide resistance (carbonation) without adversely affecting water vapor transmission (not a vapor barrier).
- Enhanced with FerroGard 901, a penetrating corrosion inhibitor - reduces corrosion even in the adjacent concrete.
- Not flammable, non-toxic.
- Conforms to U.S. Department of Agriculture standards for food contact with potable water.
- USDA approved for food industry.
- ANSI/NSF Standard 61 potable water approved.

Yield
0.51 cu. ft./unit mortar; 0.75 cu. ft/unit concrete; (SikaTop 122 + 42 lbs. 3/8 pea gravel)

Packaging
Component 'A' - 1-gal. plastic jug; 4/carton. Component 'B' - 61.5-lb. multi-wall bag.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

Shelf Life
One year in original, unopened packaging.

Storage Conditions
Store dry at 40°-95°F. Condition material to 65°-75°F before using. Protect Component 'A' from freezing. If frozen, discard.

Color
Concrete gray when mixed.

Mixing Ratio
Plant-proportioned kit, mix entire unit.

Application Time
Approximately 30 minutes.

Finishing Time
50-120 minutes.

Note: All times start after adding Component ‘B’ to Component ‘A’ and are highly affected by temperature, relative humidity, substrate temperature, wind, sun and other job site conditions.

Density (wet mix)
136 lbs./cu. ft. (2.18 kg/l)

Flexural Strength (ASTM C-293)
28 days 2,000 psi (13.8 MPa)

Splitting Tensile Strength (ASTM C-496)
28 days 750 psi (5.2 MPa)

Bond Strength* (ASTM C-882 modified)
28 days 2,200 psi (15.2 MPa)

Compressive Strength (ASTM C-109)
1 day 3,000 psi (20.7 MPa)
7 days 5,500 psi (37.9 MPa)
28 days 7,000 psi (48.3 MPa)

Permeability (AASHTO T-277) 28 days Approx. 500 Coulombs. Electrical resistivity (ohm-cm) 28,000

Corrosion Testing for FerroGard 901
Cracked Beam Corrosion Tests:
Reduced corrosion rates 63% versus control specimens
ASTM G109 modified after 400 days

How to Use
Substrate
Concrete, mortar, and masonry products.

Surface Preparation
Concrete/Mortar: Remove all deteriorated concrete, dirt, oil, grease, and all bond-inhibiting materials from surface. Be sure repair area is not less than 1/16 inch in depth. Preparation work should be done by high pressure water blast, scabbler, or other appropriate mechanical means to obtain an exposed aggregate surface with a minimum surface profile of ±1/16 inch (CSP-5). Saturate surface with clean water. Substrate should be saturated surface dry (SSD) with no standing water during application.
Reinforcing Steel: Steel reinforcement should be thoroughly prepared by mechanical cleaning to remove all traces of rust. Where corrosion has occurred due to the presence of chlorides, the steel should be high-pressure washed with clean water after mechanical cleaning. For priming of reinforcing steel use Sika Armatec 110 EpoCem (consult Technical Data Sheet).

**Priming**

Concrete Substrate: Prime the prepared substrate with a brush or sprayed applied coat of Sika Armatec 110 EpoCem (consult Technical Data Sheet). Alternately, a scrub coat of SikaTop 122 Plus can be applied prior to placement of the mortar. The repair mortar has to be applied into the wet scrub coat before it dries.

**Mixing**

Pour approximately 716 of Component 'A' into the mixing container. Add Component 'B' (powder) while mixing continuously. Mix mechanically with a low-speed drill (400 rpm) and mixing paddle or mortar mixer. Add remaining Component 'A' (liquid) to mix if a more loose consistency is desired. Mix to a uniform consistency, maximum 3 minutes. Thorough mixing and proper proportioning of the two components is necessary. For SikaTop 122 PLUS concrete: Pour all of Component 'A' into mixing container. Add all of Component 'B' while mixing, then introduce 3/6 inch coarse aggregate at desired quantity. Mix to uniform consistency, maximum 3 minutes. Addition rate is 42 lbs. per bag (approx. 3.0 to 3.5 gal. by loose volume). The aggregate must be non-reactive (reference ASTM C1288, C227 and C2280), clean, well-graded, saturated surface dry, have low absorption and high density, and comply with ASTM C 33 size number 8 per Table 2.

**Note:** Variations in the quality of the aggregate will affect the physical properties of SikaTop 122 PLUS. The yield is increased to 0.75 cu. ft./Junil with the addition of the aggregate (42 lbs.). Do not use limestone aggregate.

**Application & Finish**

SikaTop 122 PLUS must be scrubbed into the substrate, filling all pores and voids. Force material against edge of repair, working toward center. After filling repair, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with wood or sponge float for a smooth surface, or broom or burlap drag for a rough finish.

**Curing**

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. Curing compounds adversely affect the adhesion of following layers of mortar, leveling mortar or protective coatings. Moist curing should commence immediately after finishing. Protect newly applied material from direct sunlight, wind, rain and frost.

*Pre-grouting of curing compound is recommended.

**Limitations**

<table>
<thead>
<tr>
<th>Application thickness:</th>
<th>Min.</th>
<th>Max. in one lift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neat</td>
<td>1/8 inch (3 mm)</td>
<td>1 inch (25 mm)</td>
</tr>
<tr>
<td>Extended</td>
<td>1 inch (25 mm)</td>
<td>4 inches (100 mm)</td>
</tr>
</tbody>
</table>

- Minimum ambient and surface temperatures 45°F (7°C) and rising at time of application.
- Addition of coarse aggregates may result in variations of the physical properties of the mortar.
- Do not use solvent-based curing compound.
- Size, shape and depth of repair must be carefully considered and consistent with practices recommended by ACI. For additional information, contact Technical Service.
- For additional information on substrate preparation, refer to ICRI Guideline No.03732 Coatings, and Polymer Overlays.
- If aggressive means of substrate preparation is employed, substrate strength should be tested in accordance with ACI 503 Appendix A prior to the repair application.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur Hi-Mod 32.

**Caution**

Component 'A' - Irritant: May cause skinirrespiratory irritation. Avoid breathing vapors. Use with adequate ventilation. Avoid skin and eye contact. Safety goggles and rubber gloves are recommended. Component 'B' - Irritant; suspect carcinogen - Contains Portland cement and sand (crystalline silica). Skin and eye irritant. Avoid contact. Dust may cause respiratory tract irritation. Avoid breathing dust. Use only with adequate ventilation. May cause delayed lung injury (silicosis). IARC lists crystalline silica as having sufficient evidence of carcinogenicity in laboratory animals and limited evidence of carcinogenicity in humans. NTP also lists crystalline silica as a suspected carcinogen. Use of safety goggles and chemical resistant gloves is recommended. If PEL's are exceeded, an appropriate, NIOSH approved respirator is required. Remove contaminated clothing.

**First Aid**

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes, and contact a physician. For respiratory problems, remove person to fresh air.

**Clean Up**

In case of spillage, scoop or vacuum into appropriate container, and dispose of in accordance with current, applicable local, state and federal regulations. Keep container tightly closed and in an upright position to prevent spillage and leakage. Mixed components: Uncured material can be removed with water. Cured material can only be removed mechanically.

**KEEP CONTAINER TIGHTLY CLOSED - KEEP OUT OF REACH OF CHILDREN - NOT FOR INTERNAL CONSUMPTION - FOR STORED ONLY**

All information provided by this technical data sheet or any related documents relating to the application and use of Sika products, is given in good faith based on Sika's current knowledge and knowledge of its products when properly stored, handled and applied under normal conditions of storage and use conditions. In practice, the results obtained may vary due to specific conditions of use, including but not limited to the precise conditions of application (e.g. casting conditions), actual site conditions and other factors outside of Sika's control. Sika assumes no liability for the provision of such information, advice, recommendations or instruction related to its products. The user of the Sika product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with the full application of the product(s). Sika reserves the right to change the properties of its products without notice. All sales of Sika product(s) are subject to its current terms and conditions of sale which are retrievable at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742. Storing contained in any Sika materials requires the user to 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 which are available online at www.sika.com or by calling Sika's Technical Services Department at 1-800-803-4742.
SikaSwell® S-2
One part polyurethane, extrudable swelling waterstop (bentonite-free)

Description
SikaSwell S-2 is a specially formulated, high-performance, swellable, one-component, polyurethane-based waterstop for use in all kinds of construction joints. Swelling rubber creates a compression seal within joint, blocking the passage of water.

Where to Use
- Designed for construction joints in new watertight concrete structures.
- Excellent for sealing pipe penetrations through walls and floor slabs.
- Excellent for sealing joints between precast elements.
- May be applied to horizontal, vertical and overhead surfaces.
- Ideal for watertight construction joints between new and existing concrete.

Advantages
- Swells up to 100% in potable water, slightly less in salt water and wastewater.
- Permanently water resistant, with no leaching and does not dissolve in water.
- Capable of sealing construction joints with head pressures of up to 50 psi (115 ft. head).
- Elastic-withstands wet/dry cycling.
- Easy, simple application.
- Adaptable in the field to suit job requirements.
- No nails, glue, or hooks required.
- Controlled expansion eliminates cracking in fresh concrete.
- Offers resistance to various chemicals.
- Thixotropic properties allow SikaSwell S-2 to seal irregular joint surfaces.
- Very economical.
- Saves labor by eliminating inverted keyways, split forming, heat splicing, special fittings and tying to rebar associated with conventional PVC waterstops.
- No mixing required.
- Allows more thorough vibration of concrete at joint, resulting in better concrete consolidation which aids in achieving a watertight joint.

Typical Data (Material and curing conditions 73°F (23°C) and 50% R.H.)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelf life</td>
<td>9 months</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>For best results, store dry at 70°F (20°C) before using.</td>
</tr>
<tr>
<td>Color</td>
<td>Red</td>
</tr>
<tr>
<td>Temperature of Product for Best Application</td>
<td>50°C to 90°C</td>
</tr>
<tr>
<td>Tack Free Time</td>
<td>2-3 hours</td>
</tr>
<tr>
<td>Shore A Hardness</td>
<td>Swollen (7 days in tap water)  &gt;10</td>
</tr>
<tr>
<td></td>
<td>Non Swollen (7 days)</td>
</tr>
<tr>
<td>Swelling Capacity</td>
<td>1 day</td>
</tr>
<tr>
<td></td>
<td>7 days</td>
</tr>
</tbody>
</table>

Reduced and delayed swelling properties in salty water.

Suggested Cross Section of Extruded Bead

<table>
<thead>
<tr>
<th>Concrete Thickness</th>
<th>Number of Beads (in.)</th>
<th>Side length of triangular bead (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-12</td>
<td>1</td>
<td>5/8</td>
</tr>
<tr>
<td>12-20</td>
<td>1</td>
<td>3/4</td>
</tr>
<tr>
<td>&gt;20</td>
<td>2</td>
<td>3/4</td>
</tr>
</tbody>
</table>

Note: If the maximum size aggregate in the concrete is greater than 1 inch, use 3/4 inch triangular section(s).
Coverage
20 fl. oz. uni-pac sausage seals:
Triangular Yield
5/6 x 5/6 x 5/6 in. 18 lineal ft.
3/4 x 3/4 x 3/4 in. 12 lineal ft.
Note: Yield may vary based on substrate irregularities.

Packaging
Disposable 20 fl. oz., moisture-proof uni-pac sausages, 20/carton.

How to Use
Surface Preparation
Clean all surfaces. Substrate must be clean, sound, free of loose particles, dust, laitance, oils, and other contaminants. Surface may be dry or damp, with no presence of standing water. Do not leave the product in contact with wet concrete, or on a surface with a very high moisture content, for a long period of time, before casting new concrete. These conditions will decrease the adhesion between the SikaSwell S-2 bead and the surface of the joint.

Application
Recommended application temperatures: 50°-60°F. Extrude material using Sika MK-5 bulk caulking gun or other approved bulk gun. Cut the nozzle to obtain a triangular extrusion section with a size fulfilling effective needs (or use nozzle included in carton of SikaSwell S-2). Apply a uniform, continuous bead to the hardened concrete. Walk for approximately 2 hours after placement of the SikaSwell S-2 before placing concrete. The minimum thickness of concrete around the SikaSwell S-2 should be 4 inches on each side (reinforced concrete) or 6 in. on each side (non-reinforced concrete) and 4 inches on top. For optimum application, store at 70°F for a minimum of 8 hours prior to use; if the material appears stiff, knead the sausage for a short time before placing in bulk gun.

Limitations
- Not suitable for expansion joints.
- Protect from rain to avoid expansion before placing new concrete and to assure 100% swelling capacity.
- Avoid placement of the concrete from a height greater than 20 inches. If this is not possible, allow SikaSwell S-2 to cure for 2 days before placing concrete.

Caution
Avoid skin and eye contact. Use of NIOSH approved organic vapor respirator, safety goggles, and chemical resistant gloves recommended. Remove contaminated clothing and shoes.

First Aid
In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes; contact a physician. Wash clothing before re-use. Discard contaminated shoes.

Clean Up
Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. For spillage, collect and dispose of in accordance with current, applicable local, state, and federal regulations.

SikaSwell S-2 Installation
2. Cut nozzle to obtain triangular extrusion section (or use nozzle included in carton of SikaSwell S-2).
3. Apply a uniform, continuous bead to hardened concrete. Wait 2 hours before placing new concrete.

LIMITED WARRANTY: Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. SIKASHALL NOT BE LIABLE UNDER ANY THEORY OF LAW FOR ANY SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES. SIKASHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Visit our website at www.sikausa.com 1-800-933-SIKA NATIONWIDE
Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.
Sikadur® Crack Weld
Crack Injection Kit

Description
Two component, low viscosity, fast curing epoxy sealing system for repairs to cracks in concrete and solid masonry. Conforms to ASTM C-881.

Where to Use
- Low pressure injection of cracks in structural concrete and solid masonry.
- Gravity feed cracks in horizontal concrete and horizontal solid masonry.

Advantages
- As strong as concrete.
- Convenient mix in the nozzle cartridge system.
- Cartridges fit standard caulking guns.

Coverage
Capsule will yield Approx. 300 mL.
Injection resins will yield Approx. 250 mL.
(See Charts for specific coverage rates)

Packaging
- Capsule (x2) 300 mL
- Injection Resin (x2) 250 mL
- Capsule mixer nozzle (x2)
- Capsule applicator fan (x2)
- Cartridge Flow Restrictor (x1)
- Injection resin mixers with extended tube (x2)
- Push fit connector (x1)
- Injection Ports (x10)
- Pair of Gloves (x2)
- Wooden Applicator (Tongue Depressor) (x2)
- Instructional DVD (x1)

How to Use
Surface Preparation
- For a successful application, very thorough preparation is a must. The crack to be treated must be dry and free from oil, grease, dust and other contaminants. Any loose material must be blown or brushed clear.
- For Vertical Cracks (walls, columns, beams) - The surface of the crack should be sealed with the fast setting Sikadur Capsule supplied. The Capsule should also be used to affix the injection ports. The distance between the injection ports should be greater than the estimated depth of the crack (typically 1.5 times. If depth is not known, consult technical services).
- For Horizontal Cracks (floors, slabs, etc.) - The Sikadur Capsule and injection ports may not be required as the resin may be introduced into the crack by gravity.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)
RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

| Shelf Life | 16 months in original, unopened containers. |
| Storage Conditions | Store dry at 40°-75°F (5°-24°C) |
| Product Conditioning | Condition dry at 40°-75°F (5°-24°C) |

For Sikadur Injection Resin:

<table>
<thead>
<tr>
<th>Compressive Strength (ASTM D-695), psi MPa</th>
<th>40°F</th>
<th>60°F</th>
<th>95°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 hours</td>
<td>-</td>
<td>-</td>
<td>600 (3.4)</td>
</tr>
<tr>
<td>8 hours</td>
<td>-</td>
<td>-</td>
<td>2000 (13.7)</td>
</tr>
<tr>
<td>16 hours</td>
<td>-</td>
<td>-</td>
<td>3500 (24.1)</td>
</tr>
<tr>
<td>1 day</td>
<td>-</td>
<td>-</td>
<td>5000 (34.5)</td>
</tr>
<tr>
<td>3 days</td>
<td>1500 (10.3)</td>
<td>-</td>
<td>8500 (56.6)</td>
</tr>
<tr>
<td>7 days</td>
<td>6500 (44.8)</td>
<td>-</td>
<td>9000 (62.1)</td>
</tr>
<tr>
<td>14 days</td>
<td>7500 (51.7)</td>
<td>-</td>
<td>9500 (65.0)</td>
</tr>
<tr>
<td>28 days</td>
<td>9000 (62.1)</td>
<td>-</td>
<td>10,000 (66.9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compressive Modulus (ASTM D-695)</th>
<th>200,000 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity Mixed (ASTM D-2393)</td>
<td>500 cps</td>
</tr>
<tr>
<td>Pot Life (ASTM C-881)</td>
<td>25-30 min. (60g mass)</td>
</tr>
<tr>
<td>Tensile Strength (ASTM D-638)</td>
<td>6000 psi</td>
</tr>
<tr>
<td>Elongation at Break (ASTM D-638)</td>
<td>25 %</td>
</tr>
<tr>
<td>Tensile Modulus (ASTM D-638)</td>
<td>250,000 psi</td>
</tr>
<tr>
<td>Flexural Strength (ASTM D-732)</td>
<td>10,000 psi</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bond Strength (ASTM D-897)</th>
<th>2 day</th>
<th>14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>350 psi (concrete failure)</td>
<td>450 psi (concrete failure)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Absorption (ASTM D-570)</th>
<th>0.24%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Deflection Temp. (ASTM D-448)</td>
<td>109.7°F</td>
</tr>
<tr>
<td>VOC:</td>
<td>Capsule: 30 g/L</td>
</tr>
<tr>
<td></td>
<td>Inj. Resin: 5 g/L</td>
</tr>
</tbody>
</table>
For Sikadur Caps seal:

<table>
<thead>
<tr>
<th>Temp. ('F)</th>
<th>Gel Time (min)</th>
<th>Ready for Injection (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>18</td>
<td>145</td>
</tr>
<tr>
<td>50</td>
<td>10</td>
<td>85</td>
</tr>
<tr>
<td>68</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>77</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>86</td>
<td>4</td>
<td>35</td>
</tr>
</tbody>
</table>

Coverage Rates:

<table>
<thead>
<tr>
<th>Consumption of Crack Injection Resin in a crack</th>
<th>Length (in)</th>
<th>Width (in)</th>
<th>Depth (in)</th>
<th>Cu. Inches</th>
<th># of Tubes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16&quot; wide crack - 1&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.002</td>
<td>1</td>
<td>7.44</td>
<td>0.4</td>
</tr>
<tr>
<td>1/16&quot; wide crack - 1.5&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.002</td>
<td>1.5</td>
<td>11.16</td>
<td>0.6</td>
</tr>
<tr>
<td>1/16&quot; wide crack - 2&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.002</td>
<td>2</td>
<td>14.88</td>
<td>0.8</td>
</tr>
<tr>
<td>1/8&quot; wide crack - 1&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.125</td>
<td>1</td>
<td>15</td>
<td>0.8</td>
</tr>
<tr>
<td>1/8&quot; wide crack - 1.5&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.125</td>
<td>1.5</td>
<td>22.5</td>
<td>1.2</td>
</tr>
<tr>
<td>1/8&quot; wide crack - 2&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.125</td>
<td>2</td>
<td>30</td>
<td>1.6</td>
</tr>
<tr>
<td>1/4&quot; wide crack - 1&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.25</td>
<td>1</td>
<td>30</td>
<td>1.6</td>
</tr>
<tr>
<td>1/4&quot; wide crack - 1.5&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.25</td>
<td>1.5</td>
<td>45</td>
<td>2.4</td>
</tr>
<tr>
<td>1/4&quot; wide crack - 2&quot; deep and 10 ft. Long</td>
<td>120</td>
<td>0.25</td>
<td>2</td>
<td>60</td>
<td>3.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumption of Crack Injection Paste on a crack</th>
<th>Length (in)</th>
<th>Width (in)</th>
<th>Depth (in)</th>
<th>Cu. Inches</th>
<th># of Tubes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; Wide Strip - 10 ft. Long and 1/8&quot; thick</td>
<td>120</td>
<td>1</td>
<td>0.125</td>
<td>15</td>
<td>0.8</td>
</tr>
<tr>
<td>1&quot; Wide Strip - 10 ft. Long and 1/4&quot; thick</td>
<td>120</td>
<td>1</td>
<td>0.25</td>
<td>30</td>
<td>1.6</td>
</tr>
<tr>
<td>1.5&quot; Wide Strip - 10 ft. Long and 1/8&quot; thick</td>
<td>120</td>
<td>1.5</td>
<td>0.125</td>
<td>22.5</td>
<td>1.2</td>
</tr>
<tr>
<td>1.5&quot; Wide Strip - 10 ft. Long and 1/4&quot; thick</td>
<td>120</td>
<td>1.5</td>
<td>0.25</td>
<td>45</td>
<td>2.4</td>
</tr>
<tr>
<td>2.0&quot; Wide Strip - 10 ft. Long and 1/8&quot; thick</td>
<td>120</td>
<td>2</td>
<td>0.125</td>
<td>30</td>
<td>1.6</td>
</tr>
<tr>
<td>2.0&quot; Wide Strip - 10 ft. Long and 1/4&quot; thick</td>
<td>120</td>
<td>2</td>
<td>0.25</td>
<td>60</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Mixing

Cartridge Set Up:
Sikadur Caps seal - Open screw cap, cut film to remove metal clip and attach nozzle, extrude waste until a uniform color is achieved.
Sikadur Injection Resin - Remove screw cap, insert outlet plugs, attach mixer nozzle with extension tube*. Extrude waste to form a homogeneous mix. Use the push fit connector to connect to injection port.
*For horizontal cracks (floor, slab, etc.), remove the extension tube.

Application

For Vertical Cracks (walls, columns, beams) - The resin should be injected into the first (lower) port. When the resin begins to flow from the adjacent port, close off the first port and disconnect the hose. Reconnect to the second port and inject until resin starts to flow from the third; this process is repeated until the whole crack has been injected. After the resin has been allowed to cure, the injection ports and capseal should be removed and any holes or voids should be filled.
For Horizontal cracks (floors, slabs, etc.) - To gravity feed cracks, seal the underside of the substrate prior to filling if the crack reflects through. Dispense the injection resin slowly into the vee-notched crack. Continue injecting until completely filled.

Removal

After the resin has been allowed to cure, the injection ports and capseal should be mechanically removed and any holes or voids should be filled.

Limitations

- Minimum substrate and ambient temperature 40°F (5°C). Maximum substrate temperature 95°F (45°C).
- Minimum age of concrete must be 21-28 days, depending on curing and drying conditions.
- Do not apply over wet, glistening surfaces.
- Not for injection of cracks subjected to osmotic or hydrostatic pressure during application.
- Do not inject cracks greater than 1/4 in (6mm). Consult Sika Technical Services.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.
- NOT FOR USE AS AN ANCHORING ADHESIVE.
Caution

PART A: WARNING: COMBUSTIBLE, IRRITANT. Contains 1-ethyl-3-methylbenzene (CAS: 100-80-1) and titanium dioxide (CAS: 13463-67-7). Keep away from heat, sparks, electrical equipment, and open flame. DO NOT SMOKE. Use only in well ventilated areas. May cause skin-eye/respiratory tract irritation. May be harmful if inhaled in high concentrations. May cause gastrointestinal disturbance. Reports have associated repeated and prolonged exposure to some of the chemicals in this product with permanent brain, liver, kidney and nervous system damage. Intentional misuse by deliberate concentration and inhalation of vapors may be harmful or fatal.

WARNING! This product contains a chemical known in the State of California to cause cancer.

PART B: WARNING: ORGANIC PEROXIDE, IRRITANT, SENSITIZER. Contains dibenzoyl peroxide (CAS: 94-36-0). Keep away from heat, sparks, electrical equipment, and open flame. DO NOT SMOKE. Use only in well ventilated areas. May cause eye/respiratory tract irritation. May cause skin sensitization after prolonged contact. May cause gastrointestinal disturbance.

PART C: WARNING: CORROSIVE, IRRITANT, SENSITIZER. Avoid direct contact. Contains 2-piperazin-1-yl-ethylamine (CAS: 140-31-8), Phenol, styrenated (CAS: 61788-44-1), Benzyl alcohol (CAS: 100-51-6), 2,4,6-tris(dimethylaminomethyl)phenol (CAS: 90-72-2), 1,3-Cyclohexanediol (CAS: 2579-20-6), Salicylic acid (CAS: 69-72-7) and Cyclohexanone (CAS: 108-94-1). Causes eye/ skin burns. Harmful if swallowed. May cause irritation/burns to the digestive tract. May cause allergic skin reaction after prolonged contact. Reports have associated repeated and prolonged exposure to some of the chemicals in this product with permanent brain, liver, kidney and nervous system damage. Intentional misuse by deliberate concentration and inhalation of vapors may be harmful or fatal. Strictly follow all usage, handling and storage instructions.

First Aid

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. Get medical attention immediately. Skin Contact: In case of contact, immediately flush skin with plenty of soap and water. Get medical attention immediately. Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Seek medical attention or call poison control.

General Advice: In case of accident or if you feel unwell, seek medical attention immediately. (Show the label or MSDS where possible.)

Note to Physicians: Symptoms may not appear immediately.

Handling and Storage

Store dry at 40°-75°F (5-24°C). This crack injection kit contains epoxy resin and hardener systems, which are considered classified as hazardous materials. Wear suitable protective clothing, eyewear protection and gloves, and ensure adequate ventilation. For more health and data info, please refer to the relevant Material Safety Data Sheet.

Clean Up

After the resin has been allowed to cure, the injection ports and capseal should be mechanically removed and any holes or voids should be filled.

Important Note

While all reasonable care is taken in compiling technical data on the Company's products, all recommendations or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the Company. It is the customer's responsibility to satisfy himself that each product is fit for the purpose for which he intends to use it, that the actual conditions of use are suitable and that, in the light of our continual research and development program, the information relating to each product has not been superseded.
Sikadur® 31, Hi-Mod Gel (1:1 Mix Ratio)
High-modulus, high-strength, structural, epoxy paste adhesive

Description
Sikadur 31, Hi-Mod Gel, is a 2-component, 100% solids, solvent-free, moisture-tolerant, high-modulus, high-strength, structural epoxy paste adhesive. It conforms to the current ASTM C-881, Types I and IV, Grade-3, Class-B/C and AASHTO M-235 specifications.

Where to Use
- Structural bonding of concrete, masonry, metals, wood, etc. to a maximum glue line of ¼ in. (3 mm).
- Grout bolts, dowels, and pins.
- Seals cracks and around injection ports prior to pressure-injection grouting.
- Interior, vertical, and overhead repair of concrete as an epoxy mortar binder.
- As a pick-proof sealant around windows, doors, lock-ups etc. inside correctional facilities.

Advantages
- Meets physical requirements of ASTM C-881 Types I, II & IV, Grade 3, Classes B & C.
- Suitable for potable water contact, meets NSF/ANSI Standard 61.
- Excellent adhesion to concrete, masonry, metals, wood, and most structural materials.
- Paste consistency ideal for vertical and overhead repair of concrete.
- Fast-setting and strength-producing adhesive.
- Convenient easy mix ratio A:B = 1:1 by volume.

Typical Data (Material and curing conditions @ 73°F (23°C) and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL BITE CONDITIONS AND CURING CONDITIONS.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelf Life</td>
<td>2 years in original, unopened containers</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>Store dry at 40°-95°F (4°-35°C). Condition material to 65°-85°F (18°-29°C) before using.</td>
</tr>
<tr>
<td>Color</td>
<td>Gray</td>
</tr>
<tr>
<td>Consistency</td>
<td>Non-sag paste</td>
</tr>
<tr>
<td>Pot Life</td>
<td>Approximately 60 minutes @ 73°F, (500 gram mass)</td>
</tr>
<tr>
<td>Tack-Free Time</td>
<td>1.5 - 2.5 hours at 30 mills. thick</td>
</tr>
<tr>
<td>Tensile Properties (ASTM D-638)</td>
<td>7 day Tensile Strength 3,300 psi (22.7 MPa) Elongation at Break 0.9 %</td>
</tr>
<tr>
<td>Flexural Properties (ASTM D-790)</td>
<td>7 day Flexural Strength (Modulus of Rupture) 6,100 psi (42.0 MPa) Tangent Modulus of Elasticity in Bending 1.67 X 10³ psi (11,520 MPa)</td>
</tr>
<tr>
<td>Shear Strength (ASTM D-732)</td>
<td>7 day Shear Strength 4,600 psi (31.7 MPa)</td>
</tr>
<tr>
<td>Bond Strength (ASTM C-882)</td>
<td>2 day 420 psi (2.9 MPa)</td>
</tr>
<tr>
<td>Heat Deflection Temperature (ASTM D-848) 7 day (Fiber Stress Loading = 264 psi) 135°F (57°C) 40°F (4°C)** 73°F (23°C)* ** 90°F (32°C)* **</td>
<td></td>
</tr>
<tr>
<td>Water Absorption (ASTM D-570)</td>
<td>24 hour 0.07%</td>
</tr>
<tr>
<td>Compressive strength (ASTM D-695) psi (MPa) 40°F (4°C)** 73°F (23°C)* ** 90°F (32°C)* **</td>
<td></td>
</tr>
<tr>
<td>2 hour</td>
<td>720 (5.5) 450 (3.1)</td>
</tr>
<tr>
<td>4 hour</td>
<td>800 (5.5) 10,500 (72.4)</td>
</tr>
<tr>
<td>8 hour</td>
<td>8,500 (58.6) 12,200 (84.1)</td>
</tr>
<tr>
<td>16 hour</td>
<td>700 (4.8) 10,500 (72.4) 13,000 (89.8)</td>
</tr>
<tr>
<td>1 day</td>
<td>6,000 (41.4) 13,000 (89.8) 15,000 (103.4)</td>
</tr>
<tr>
<td>3 day</td>
<td>11,000 (75.8) 14,000 (96.5) 18,000 (110.3)</td>
</tr>
<tr>
<td>7 day</td>
<td>12,000 (86.9) 15,000 (103.4) 18,000 (110.3)</td>
</tr>
<tr>
<td>14 day</td>
<td>13,000 (93.0) 15,400 (106.1) 18,000 (110.3)</td>
</tr>
<tr>
<td>28 day</td>
<td>14,000 (98.5) 16,000 (110.3) 18,000 (110.3)</td>
</tr>
<tr>
<td>Compressive Modulus of Elasticity (ASTM D-695) 7 day 7.95 X 10³ psi (5,485 MPa)</td>
<td></td>
</tr>
</tbody>
</table>

* Material cured and tested at temperatures indicated.  
** See Limitations section for further information.
### Coverage
1 gal. yields 231 cu. in. (3,785 cm³) of epoxy paste adhesive. 1 gal. (3.8 L) mixed with 1 gal. (3.8 L) by loose volume of oven-dried aggregate yields approximately 346 cu. in. (5,570 cm³) of epoxy mortar.

### Packaging
1 gal. and 3 gal. (11.4 L) units.

### How to Use

#### Surface Preparation
Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, and any other contaminants.

**Preparation Work:**
- **Concrete** - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or equivalent mechanical means.
- **Steel** - Should be cleaned and prepared thoroughly by blastcleaning.

#### Mixing
Pre-mix each component. Proportion 1 part Component 'B' to 1 part Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400-600 rpm) drill until uniform in color. Mix only that quantity which can be used within its pot life. Prior to mixing, material should be conditioned to 65°-85°F (18°-29°C). To prepare an epoxy mortar, slowly add up to 1 part, by loose volume of an oven-dried aggregate, to 1 part of the mixed Sikadur 31, Hi-Mod Gel, and mix until uniform in consistency.

#### Application
As a structural adhesive - Apply the neat mixed Sikadur 31, Hi-Mod Gel to the prepared substrates. Work into the substrate for positive adhesion. Secure the bonded unit firmly into place until the adhesive has cured. Glue line should not exceed 1/8-in. (3 mm).

To seal cracks for injection grouting - Place the neat mixed material over the cracks to be pressure injected and around each injection port. Allow sufficient time to set before pressure injecting.

For interior vertical and overhead patching - Place the prepared mortar in void, working the material into the prepared substrate, filling the cavity. Strike off level. Lifts should not exceed 1-in (25 mm).

As a pick-proof sealant - Use automated or manual method. Apply an appropriate size bead of material around the area being sealed. Seal with neat Sikadur 31, Hi-Mod Gel.

### Limitations
- **THE NTBS HAS STATED THAT THIS PRODUCT IS APPROVED FOR SHORT TERM LOADS ONLY AND SHOULD NOT BE USED IN SUSTAINED TENSILOAD ADHESIVE ANCHORING APPLICATIONS WHERE ADHESIVE FAILURE COULD RESULT IN A PUBLIC SAFETY RISK. CONSULT A DESIGN PROFESSIONAL PRIOR TO USE.**
- Components of original 2:1 mix ratio formulation of Sikadur 31, Hi-Mod Gel cannot be cross-mixed with components of Sikadur 31, Hi-Mod Gel (NEW 1:1 Mix Ratio) formulation.
- Minimum substrate and ambient temperature 40°F (4°C).
- Do not thin. Solvents will prevent proper cure.
- When preparing an epoxy mortar, use oven-dried aggregate only.
- Maximum epoxy mortar thickness is 1 in. (25 mm) per lift.
- Epoxy mortar is for interior use only. Material is a vapor barrier after cure.
- Minimum age of concrete must be 21-28 days, depending upon curing and drying conditions, for mortar applications.
- Porous substrates must be tested for moisture-vapor transmission prior to mortar applications.
- Not for sealing cracks under hydrostatic pressure.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

### WARNING
- **Component 'A' - IRRITANT, SENSITIZER.** Contains epoxy resin, silica, and calcium carbonate. Causes eye irritation. May cause skin/respiratory irritations. Prolonged and/or repeated contact with skin may cause allergic reaction/sensitization. Harmful if swallowed. Deliberate concentrations of vapors for purposes of inhalation is harmful and can be fatal.
- **Component 'B' - CORROSIVE, SENSITIZER, IRRITANT.** Contains amines, silica, and calcium carbonate. Contact with skin and eyes causes severe burns. Causes eye/skin/respiratory irritation. Prolonged and/or repeated contact may cause allergic reaction/sensitization. Harmful if swallowed. Deliberate concentrations of vapors for purposes of inhalation is harmful and can be fatal.

Cured material, if sanded, may result in exposure to a chemical known to the State of California to cause cancer.

### First Aid
- **Eyes** - Hold eyelids apart and flush thoroughly with water for 15 minutes. Skin - Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. Inhalation - Remove person to fresh air. Ingestion - Do not induce vomiting. Contact a physician. In all cases, contact a physician immediately if symptoms persist.

### Handling & Storage
Avoid direct contact with eyes and skin. Wear chemical resistant gloves/goggles/clothing. Avoid breathing vapors. Use with adequate general and local exhaust ventilation. Use a properly fitted NIOSH approved respirator. Wash thoroughly after handling product. Remove contaminated clothing and launder before reuse. Store product in a closed container in a cool, dry place.
Clean Up

Avoid contact. Wear chemical resistant clothing/gloves/goggles. In absence of adequate ventilation, use a properly fitted NIOSH respirator. Uncured material can be removed with solvent. Follow solvent manufacturer's instructions for use and warnings. Cured material (when Component 'A' combined with Component 'B') can only be removed mechanically. In case of spill, ventilate area and contain spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations.
**Sikadur® Combiflex®**

Unique ‘strip and seal’ system to seal and waterproof the unusual joint

**Description**
Versatile sealing system for irregular and difficult joints and cracks. Withstands extreme movements and chemical exposures while maintaining a watertight seal. The system consists of Sikadur 31, Hi-Mod Gel, epoxy adhesive, and Combiflex perforated Hypalon® sealing strip.

**Where to Use**
- Types of Joints: construction, expansion, cracks, connecting
- Types of Substrates: concrete, mortar, steel, iron, aluminum, brick, wood, and other building materials
- Types of Structures: tunnels, pipes, storage tanks, swimming pools, parking garages, sewage treatment tanks, roofs

**Advantages**
- Exceptional adhesion on all common building materials.
- Easy application.
- Easy repair.
- Economical solution.
- Applicable even on damp surfaces... Sikadur 31, Hi-Mod Gel, is moisture-tolerant.
- Fast-setting Sikadur 31, Hi-Mod Gel, ensures early joint use.
- Permanently elastic, even at low temperatures.
- Seals large and small irregular joints, even with high movement.
- Weather-resistant.
- Resists many chemicals.
- Withstands UV light and is ozone resistant.
- Approved for contact with potable water.
- Perforations along edges of Combiflex sheeting provide “rivet effect” and a mechanical bond to augment chemical bond.
- Contractor has advantage of always working on surface of substrate; no need to remove existing failed joint sealant.
- No prizzling; no routing; no need to clean old joints.

**Coverage**
Hypalon Sheeting - 20 lineal ft./roll. Sikadur 31, Hi-Mod Gel - 40 lineal ft./gal. CombiflexActivator - 20 lineal ft./pt.

**Packaging**
Kits: Pre-measured kits containing 4 in. wide by 20 ft. long Hypalon sheeting, 60 oz. of Sikadur 31, Hi-Mod Gel and 1 pint of Combiflex Activator.

The component(s) may be also be purchased separately:
- Hypalon sheeting - 4, 8 and 12 in. wide by 20 ft. long and 82 ft. long.
- Sikadur 31, Hi-Mod Gel - 3 gal. units, and 12 oz. units, 12/case.

**Typical Data (Material and curing conditions 73°F (23°C) and 50% R.H.)**

**RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.**

- **Shelf life**
  Combiflex Kit - 2 years in original, unopened containers.

- **Storage Conditions**
  Store dry at 40°-95°F (4°-35°C.) Condition material to 65°-85°F before using.

- **Color**
  Sikadur 31, Hi-Mod Gel, adhesive - concrete gray.
  Hypalon sheeting - concrete gray.

**Typical Technical Data for Sikadur 31, Hi-Mod Gel, Adhesive:**
- **Pot Life**
  Approximately 30 minutes.
- **Tack Free Time**
  2-3 hours

**Typical Technical Data for Hypalon Sheeting:**
- **Tensile Properties (ASTM D-412)**
  - Tensile Strength
    - 1,000 psi (6.8 MPa)
  - Elongation at Break
    - 80%
  - Tensile Set After Break
    - 400%
- **Tear Resistance (ASTM D-624) Dlo C**
  - Resistance to Tear
    - 250 lb./in.
- **Low Temperature of Performance**
  - Maintained to -40°F

**Typical Technical Data for Sikadur Combiflex System:**
- **Peel Strength (ASTM D-903)**
  - 7 days Substrate, Concrete
    - No loss of adhesion between the Hypalon and the Sikadur 31, Hi-Mod Gel, or the Sikadur 31, Hi-Mod Gel and the concrete.
  - 12 Month Chemical Exposure
    - Water Treatment Process: immersion in potable water, aerobic, and anaerobic treatment tanks.
    - No change in performance. Combiflex unaffected.
- **Ozone Resistance**
  - 3 month Exposure
    - Water/Ozone (3 ppm) - No Effect; Air/Ozone (2-300 ppm) - No Effect

For additional information on Sikadur 31, Hi-Mod Gel, consult Technical Data Sheet or call Technical Service.
Limitations
- Minimum surface temperature 40°F.
- Do not thin Sikadur 31, Hi-Mod Gel. Solvents will prevent proper cure.
- Maximum application thickness of:
  - Epoxy is 1/8 in.
  - Epoxy is a vapor barrier after cure.
- Cover plates over joint are required when using Comfilux in traffic areas.
- For applications in face or back-pressure joints, consult Technical Service for joint design suggestions.
- Maximum performance of the Sikadur Comfilux System is achieved only when the epoxy adhesive or the Hypalon sheeting has stress applied in service.
- Not an aesthetic product. Color may alter due to variations in lighting and UV exposure.

How to Use
Surface Preparation
Surface must be clean and sound. It may be dry or damp but free of standing water. Remove dust, laitance, rust, curing compounds, impregnations, voids, and any other contaminants.
Preparation Work: Concrete - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or equivalent mechanical means.
Steel - Should be cleaned and prepared thoroughly by blastcleaning.

Mixing
Pre-mix each component of Sikadur 31, Hi-Mod Gel. Proportion 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes using a Sika paddle on a low-speed drill (400-600 rpm) until uniform in color.

Application
Wipe Hypalon sheeting with Activator a minimum of 1 hr., and a maximum of 8 hrs., before installation. Apply the mixed Sikadur 31, Hi-Mod Gel, 1/2 in. on each side of the joint to a thickness of approximately 1/32 in. Work into the substrate for positive adhesion. Set the sheeting into the epoxy. Using a hard roller, force the sheeting down into the epoxy. Apply an additional 1/32 in. layer of epoxy as a top coat to the Hypalon sheet. Sikadur 31, Hi-Mod Gel should not be applied in greater than a 1/8-in. thickness. Sheetling may be bonded together thermally with a hand-welding tool (i.e., Lelister heat-welder or similar equipment available at waterproofing supply outlets) or by Activator. Experience demonstrates that heat welding is a quicker method if bonding two strips.

Caution
Component 'A' - Irritant; Sensitizer - Contains epoxy resin and crystalline silica (sand). Can cause skin sensitization after prolonged or repeated contact. High concentrations of vapor may cause respiratory irritation. If sanded, crystalline silica dust may be generated and may cause lung injury (silicosis) and is listed as a suspected carcinogen by NTP and IARC (2A). Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of exceedance of PELs, use an appropriate, properly filtered NIOSH approved respirator. Remove contaminated clothing. Consult MSDS for more detailed information.
Component 'B' - Corrosive; Sensitizer - Contains amines and crystalline silica (sand). Contact with eyes or skin may cause severe burns. Can cause skin and/or respiratory sensitization after prolonged or repeated contact. Skin and eye irritant. High concentrations of vapor may cause respiratory irritation. Overexposure may cause liver, kidney, and/or central nervous system effects. If sanded, crystalline silica dust may be generated and may cause delayed lung injury (silicosis) and is listed as a suspected carcinogen by NTP and IARC (2A). Avoid skin contact. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of exceedance of PELs, use an appropriate, properly filtered NIOSH approved respirator. Remove contaminated clothing. Consult MSDS for more detailed information.

First Aid
In case of skin contact, wash immediately and thoroughly with soap and water. If symptoms persist, consult a physician. For respiratory problems, remove person to fresh air; if symptoms persist, consult a physician. Remove contaminated clothing.

Clean Up
In case of spills or leaks, wear suitable protective equipment, contain spill, collect with absorbent material, and transfer to suitable container. Ventilating area. Avoid contact. Dispose of in accordance with current, applicable local, state, and federal regulations.
DIVISION 7 - THERMAL AND MOISTURE PROTECTION
Section 07900 Joint Sealers
Elastomeric and non-Elastomeric sealant

Part 1 - General

1.01 Summary
   A. This specification describes the sealing of joints and cracks subject to normal to very large movement with an epoxy resin adhesive sealing system.

1.02 Quality Assurance
   A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 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. Sikadur Combiflex, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, OH 43302 is considered to conform to the requirements of this specification.

2.02 Materials
A. Sikadur 31 Hi-Mod Gel resin adhesive:
   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. Combiflex Hypalon sheeting:
   1. Hypalon sheeting shall be composed of Hypalon rubber. It shall be perforated along the bonding edge to provide a mechanical key. It shall have the ability to be vulcanized with an aromatic hydrocarbon solvent to premit its adhesion to an epoxy resin adhesive.
   2. The sheeting shall be supplied in 20 ft. rolls or 82 ft. rolls. It shall be available in 4, 8, and 12 in. widths, at 40 mils in thickness.
   3. The sheeting shall be supplied with a removable center expansion strip.
C. Activating solvent:
   1. The activating solvent shall be an aromatic hydrocarbon with a specific gravity of 0.86.

2.03 Performance Criteria
A. Properties of the mixed uncured epoxy resin adhesive:
   1. Potlife: 30 minutes
   2. Consistency: non-sag (1/2 in. thick)
   3. Color: Gray
   4. Tack-Free Time to Touch: 2-3 hours (73°F)
B. Properties of the cured epoxy resin adhesive:
   1. Tensile Properties (ASTM D-638) at 14 days
      a. Tensile Strength: 3,300 psi (22.7 Mpa)
      b. Elongation at break: 0.9%
   2. Compressive Properties (ASTM D-695) at 28 days
      a. Compressive strength: 16,000 psi (82.8 Mpa)
      b. Compressive Modulus of Elasticity, psi: 795,000 psi (5,485 MPa)
   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 x 10⁵ psi (11,520 MPa)
   4. Shear Strength (ASTM D-732) at 7 days: 4,600 psi (31.7 Mpa)
   5. Water Absorption (ASTM D-570), 7 day, (24 hr. immersion): 0.07%
6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
   a. 2 day (dry cure) Bond Strength: 2,200 psi (22.7 Mpa)
   b. 14 day (moist cure) Bond Strength: 2,900 psi (16.6 Mpa)

7. The epoxy resin shall conform to ASTM C-881, and AASHTO M235.

C. Properties of the Hypalon Sheeting:
   1. Tensile Properties (ASTM D-412)
      a. Tensile Strength: 1,000 psi (6.8 Mpa)
      b. Elongation at Break: 800%
      c. Tensile Set after Break: 400%

   2. Tear Resistance (ASTM D-624) Die C
      a. Resistance to Tear: 250lb./in.

   3. Low Temperature of Performance: Maintained to -40F

3. Ozone Resistance (3 month Exposure)
   a. water/ozone (3 ppm) – no effect
   b. air/ozone (2-300 ppm) – no effect

Note: Tests were performed with material and curing conditions at 71°-75°F and 45-55% relative humidity.
Part 3 - Execution

3.01 Surface Preparation
A. The concrete or steel substrate must be clean, dry, sound and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, i.e. – sandblasting, etc., as approved by the engineer.

3.02 Mixing and Application
A.

1. Placement Procedure: Wipe hypalon sheeting with Activator a minimum 1 hour and maximum of 8 hours before installation. If job conditions allow, do all lapping of sheeting at the time of activating the hypalon sheeting. Laps (welds) shall be a minimum 2 in. overlap of each hypalon sheet welded together by the activator or by heat with an approved apparatus by the engineer.

2. Mixing of the epoxy resin adhesive: Premix each component. Proportion 2 parts of Component A to 1 part Component B by volume into a clean, dry mixing pail. Mix for 3 minutes with a low-speed (400-600 rpm) drill and jiffy paddle until uniform in color. Mix only that quantity that can be used within its potlife (25-45 minutes).

3. Joints shall be masked to prevent discoloration or application on unwanted areas, as directed by the engineer. If masking tape is used, it shall be removed before the epoxy resin adhesive has set. Do not apply the masking tape until just prior to the epoxy resin adhesive application.

4. Apply the mixed Sikadur 31 Hi-Mod Gel in a 1-1/2 – 2 in. wide band on each side of the joint to a thickness of approximately 1/32 in. to max. 1/8 in. Set the sheeting into the epoxy. Using a hard roller, force the sheeting down into the epoxy. Take precautions not to allow the epoxy resin adhesive to enter the joint or crack. Place the Hypalon sheeting flat over the crack or joint, or drape it into the joint or crack, as directed by the engineer. Apply a top layer of the epoxy resin adhesive on the same 1-1/2 - 2 in. wide band over the sheeting. The epoxy resin adhesive should extend 1/8 – 1/4 in. beyond the edge of the sheeting. Remove the expansion strip from the sheeting before the epoxy resin adhesive has set.

5. Adhere to all limitations and cautions for the epoxy resin adhesive as stated in the manufacturers printed literatures.

3.03 Cleaning
A. The uncured epoxy resin adhesive can be cleaned 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.
1. Wipe Hypalon sheeting with Combflex Activator a minimum of 1 hour and a maximum of 8 hours before installation.

2. Apply the mixed Sikadur 31 Hi-Mod Gel epoxy resin adhesive on each side of the crack to a thickness of approximately 1/32". Sikadur 31 Hi-Mod Gel should not be applied greater than 1/8" thick. Work into the substrate for positive adhesion. Bond area should be a minimum of 1½" on both sides of crack.

3. Set the sheeting into the epoxy resin adhesive. Using a hard roller, force the sheeting down into the epoxy.

4. Apply an additional 1/32" layer of epoxy as a top coat to the Hypalon sheeting. The epoxy resin adhesive should extend 1/8" -1/4" beyond the edge of the sheeting

5. Remove the red expansion strip from the sheeting before the epoxy resin adhesive has set.
1. Wipe Hypalon sheeting with Combiflex Activator a minimum of 1 hour and a maximum of 8 hours before installation.

2. Apply the mixed Sikadur 31, Hi-Mod Gel epoxy resin adhesive on each side of the crack to a thickness of approximately 1/32". Sikadur 31 Hi-Mod Gel should not be applied greater than an 1/8" thick. The epoxy resin adhesive should extend 1/8" – 1/4" beyond the edge of the sheeting. Work into the substrate for positive adhesion. Bond area should be a minimum of 1/4" on both sides of crack.

3. Set the sheeting into the epoxy resin adhesive. Using a hard roller, force the sheeting down into the epoxy.

4. Apply an additional 1/32" layer of epoxy as a top coat to the Hypalon sheeting.

5. Remove the red expansion strip from the sheeting before the epoxy resin adhesive has set.

Note: When applied over a traffic-bearing joint Sikadur Combiflex should be protected from damage by installing a cover plate which is bolted at one side and allows for proper expansion and contraction of the joint.

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