

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	<ul style="list-style-type: none"> ■ Structural bonding of concrete, masonry, metals, wood, etc. to a maximum glue line of 1/8 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	<ul style="list-style-type: none"> ■ 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 SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	2 years in original, unopened containers		
Storage Conditions	Store dry at 40°-95°F (4°-35°C). Condition material to 65°-85°F (18°-29°C) before using.		
Color	Gray		
Mixing Ratio	Component 'A' : Component 'B' = 1:1 by volume		
Consistency	Non-sag paste		
Pot Life	Approximately 60 minutes @ 73°F. (500 gram mass)		
Tack-Free Time	1.5 - 2.5 hours at 30 mils. thick		
Tensile Properties (ASTM D-638)			
7 day	Tensile Strength	3,300 psi (22.7 MPa)	
	Elongation at Break	0.9 %	
Flexural Properties (ASTM D-790)			
7 day	Flexural Strength (Modulus of Rupture)	6,100 psi (42.0 MPa)	
	Tangent Modulus of Elasticity in Bending	1.67 X 10 ⁶ psi (11,520 MPa)	
Shear Strength (ASTM D-732)	7 day	Shear Strength	4,600 psi (31.7 MPa)
Bond Strength (ASTM C-882)			
	Hardened Concrete to Hardened Concrete:		
2 day (dry cure)	2,200 psi (15.2 MPa)		
2 day (moist cure)	2,400 psi (16.5 MPa)		
14 day (moist cure)	2,900 psi (20.0 MPa)		
	Hardened Concrete to Steel:		
2 day (dry cure)	2,900 psi (20.0 MPa)		
Tensile Bond Strength (Pull-off Method, Dyna, ASTM C-1583-04)			
2 day	420 psi (2.9 MPa)		
Heat Deflection Temperature (ASTM D-648)	7 day	(Fiber Stress Loading = 264 psi)	135°F (57°C)
Water Absorption (ASTM D-570)	24 hour	0.07%	
Compressive strength (ASTM D-695) psi (MPa)			
	40°F (4°C)***	73°F (23°C)**	90°F (32°C)**
2 hour	-	-	450 (3.1)
4 hour	-	800 (5.5)	10,500 (72.4)
8 hour	-	8,500 (58.6)	12,200 (84.1)
16 hour	700 (4.8)	10,500 (72.4)	13,000 (89.6)
1 day	6,000 (41.4)	13,000 (89.6)	15,000 (103.4)
3 day	11,000 (75.8)	14,000 (96.5)	16,000 (110.3)
7 day	12,900 (88.9)	15,000 (103.4)	16,000 (110.3)
14 day	13,500 (93.0)	15,400 (106.1)	16,000 (110.3)
28 day	14,000 (96.5)	16,000 (110.3)	16,000 (110.3)
Compressive Modulus of Elasticity (ASTM D-695)	7 day	7.95 X 10 ⁵ psi (5,485 MPa)	

* Material cured and tested at temperatures indicated.

** See Limitations section for further information.

Construction



Coverage	1 gal. yields 231 cu. in. (3,785 cm ³) 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. (5,670 cm ³) 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	<ul style="list-style-type: none"> ■ THE NTSB HAS STATED THAT THIS PRODUCT IS APPROVED FOR SHORT TERM LOADS ONLY AND SHOULD NOT BE USED IN SUSTAINED TENSILE LOAD 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	<p>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.</p> <p>Component 'B' - CORROSIVE, SENSITIZER, IRRITANT. Contains Amines, silica quartz (sand), 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.</p> <p>Cured material, if sanded, may result in exposure to a chemical known to the State of California to cause cancer.</p>
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.

Construction

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.

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1-800-933-SIKA NATIONWIDE

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 800-933-7452
Fax: 201-933-6225

Sika Canada Inc.
601 Delmar Avenue
Pointe Claire
Quebec H9R 4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537



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