

PRODUCT DATA SHEET

Sikadur® F 2000

(formerly MBrace F 2000)

HIGH-VISCOSITY EPOXY PASTE FOR THE SIKA® CARBODUR® CFRP COMPOSITE STRENGTHENING SYSTEM

PRODUCT DESCRIPTION

Sikadur® F 2000 is a 100% solids non-sag epoxy paste for use with the Sika® CarboDur® and SikaWrap® Composite Strengthening Systems.

USES

- Adhesive for bonding external reinforcement to concrete, masonry, steel, wood, stone, etc.
- Structural bonding of composite laminates (Sika® CarboDur® CFRP) to concrete.
- Excellent for filling small voids or to smooth small offsets on concrete substrate.
- Structural bonding of steel plates to concrete.
- Suitable for use in horizontal, vertical, and overhead configurations.

Substrates:

- Concrete
- Masonry
- Steel

CHARACTERISTICS / ADVANTAGES

- 100% solids epoxy Low odor, low VOC's
- Suitable for low-temperature application can be applied if the temperature is 35° F and rising; extends application window in cooler conditions
- Paste consistency ideal for vertical and overhead applications of Sika® CarboDur®.
- Color-coded components to ensure proper mixing control.

PRODUCT INFORMATION

Chemical Base	Two-part, 100% solids, non-sag epoxy paste Mixed Weight: 10.5 lb/gal (1259 g/L)
Packaging	<ul style="list-style-type: none"> ▪ Part A – 3 qts; 2 gal pail; 8 lbs ▪ Part B – 1 qt; 1 qt can; 2.5 lbs ▪ Available in 1 gal (3.8 L) units.
Shelf Life	18 months when properly stored
Storage Conditions	Store in unopened containers in a clean, dry area between 50 and 90° F (10 to 32° C) away from direct sunlight, flame, or other hazards.

Color	Part A – Light Gray Part B – Charcoal Mixed – Gray
Density	75.8 pcf (1258 kg/m ³)
Flash Point	Part A: 210° F (99° C) Part B: >200° F (93° C) (Pensky-Martens Closed Cup)
Viscosity	Mixed Viscosity at 50° F (10° C) 74,000 cps at 77° F (25° C) 45,000 cps at 90° F (32° C) 33,000 cps

TECHNICAL INFORMATION

Compressive Strength	Yield Strength 3300 psi (22.8 MPa)	(ASTM D 695) at 72 ° F (20 ° C) and 40% relative humidity
	Strain at Yield 4.0%	(ASTM D 695) at 72 ° F (20 ° C) and 40% relative humidity
	Elastic Modulus 155 ksi (1076 MPa)	(ASTM D 695) at 72 ° F (20 ° C) and 40% relative humidity
	Ultimate Strength 3300 psi (22.8 MPa)	(ASTM D 695) at 72 ° F (20 ° C) and 40% relative humidity
	Rupture Strain 10%	(ASTM D 695) at 72 ° F (20 ° C) and 40% relative humidity
Flexural Strength	Yield Strength 3800 psi (26.2 MPa)	(ASTM D 790) at 72 ° F (20 ° C) and 40% relative humidity
	Strain at Yield 4.0%	(ASTM D 790) at 72 ° F (20 ° C) and 40% relative humidity
	Elastic Modulus 130 ksi (895 MPa)	(ASTM D 790) at 72 ° F (20 ° C) and 40% relative humidity
	Ultimate Strength 4000 psi (27.6 MPa)	(ASTM D 790) at 72 ° F (20 ° C) and 40% relative humidity
	Rupture Strain 7%	(ASTM D 790) at 72 ° F (20 ° C) and 40% relative humidity
Modulus of Elasticity in Flexure	Yield Strength 1800 psi (12 MPa)	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
	Strain at Yield 1.5%	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
	Elastic Modulus 260 ksi (1800 MPa)	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
	Ultimate Strength 2200 psi (15.2 MPa)	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
	Rupture Strain 7%	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
Poisson's ratio	0.48	(ASTM D 638) at 72 ° F (20 ° C) and 40% relative humidity
Coefficient of Thermal Expansion	20·10 ⁻⁶ /° F (35·10 ⁻⁶ /° C)	Based on testing of cured samples at 72 ° F (20 ° C) and 40% relative humidity.

Thermal Conductivity	1.32 Btu·in/hr·ft ² ° F (0.19 W/m·°K)	Based on testing of cured samples at 72 ° F (20 ° C) and 40% relative humidity.
Glass transition temperature	168° F (75° C)	Based on testing of cured samples at 72 ° F (20 ° C) and 40% relative humidity

APPLICATION INFORMATION

Coverage	100 to 250 ft ² /gal (4.9 to 6.1 m ² /L) (Coverage rate on concrete and masonry may vary depending on the density and porosity of the substrate) Type S 512 CarboDur [®] : approx. 50 LF/gal.; Type S 812 CarboDur: approx. 32 LF/gal.; Type S 1012 CarboDur [®] : approx. 22 LF/gal
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BASIS OF PRODUCT DATA

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

LIMITATIONS

For Best Performance

- Only apply Sikadur[®] F 2000 when the ambient temperature is between 35° and 120° F (2° and 50° C).
- Subsequent components of the Sikadur System should be applied within 48 hours of applying Sikadur[®] F 2000 to the substrate to ensure proper adhesion.
- If more than 48 hours have passed following application of Sikadur[®] F 2000 the surface shall be lightly abraded and cleaned with a solvent wipe prior to applying the next component
- Make certain the most current versions of the product data sheet and SDS are being used; visit usa.sika.com to verify the most current versions.
- Proper application is the responsibility of the user. Field visits by Sika personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the job site.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

APPLICATION INSTRUCTIONS

NOTES ON INSTALLATION

Observe Working Time Limitation

- Catalyze no more material than can be applied within the work time period.

- Available work time, temperature and complexity of the application area will determine how much material should be catalyzed at one time.
- Keep material cool and shaded from direct sunlight in warm weather. During hot weather, work time can be extended by keeping material cool before and after mixing or by immersing pot in ice water.

Maintenance

1. Periodically inspect the applied material and repair localized areas as needed. Consult a Sika representative for additional information.
2. Visit us on the web for the most current product information and news: usa.sika.com.

SUBSTRATE PREPARATION

The concrete surface should be prepared to a minimum concrete surface profile (CSP) 3 defined by the ICRI surface-profile chips. Localized out-of-plane variations, including form lines, should not exceed 1/32 in. (1 mm). Surface must be clean and sound. It may be dry or damp, but free of standing water and frost. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, disintegrated materials, and other bond inhibiting materials from the surface

MIXING

1. The mix ratio is 3:1 (Part A to Part B) by volume or 100:30 (Part A to Part B) by weight. Mix only the amount of material that can be used within the working time of the material. Approximate working times for a 1 gal (3.8 L) unit are: 95 min at 50° F (10° C) 40 min at 77° F (25° C) 15 min at 90° F (32° C)
2. Part A (resin) must be pre-mixed using a low-speed drill (600 rpm) and mixing paddle (e.g., a Jiffy Mixer). Keep the paddle below the surface of the material to avoid entrapping air. Pre-mix for a minimum of 3 minutes.
3. Carefully measure (ratio) each component and then add Part B (hardener) to Part A (resin).
4. Mix Parts A and B using a low-speed drill (600 rpm) and mixing paddle (e.g., a Jiffy mixer). Carefully scrape the sides and bottom of the container while mixing. Keep the paddle below the surface of the material to avoid entrapping air. Proper mixing will take at least 3 – 5

minutes. Well-mixed material will be free of streaks or lumps.

5. If a thicker consistency is desired, silica flour (S-11 Powder) may be mixed into the material using a low-speed drill and mixing paddle. Add as much silica flour as is needed to achieve the desired consistency.

APPLICATION

1. Apply the Sikadur® F 2000 to the primed substrate using a spring-steel trowel.
2. For bonded, external reinforcement: Apply the neat mixed Sikadur® F 2000 onto the concrete with a trowel or spatula to a nominal thickness of 1/16" (1.5 mm). Apply the mixed Sikadur® F 2000 onto the CarboDur® laminate with a "roof-shaped" spatula to a nominal thickness of 1/16" (1.5 mm). Within the open time of the epoxy, depending on the temperature, place the CarboDur® laminate onto the concrete surface. Using a hard rubber roller, press the laminate into the epoxy resin until the adhesive is forced out on both sides. Remove excess adhesive. Glue line should not exceed 1/8 inch (3 mm). The external reinforcement must not be disturbed for a minimum of 24 hours. The epoxy will reach its design strength after 7 days.
3. For interior vertical and overhead patching: Work the material into the prepared substrate, filling the cavity. Strike off level. Lifts should not exceed 1 inch (25 mm).

CLEANING OF TOOLS

Use xylene or methyl ethyl ketone. Observe fire and health precautions with solvents.

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the

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Product Data Sheet

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current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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 Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL 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.**

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