

# Sikacem® 103F

Machine-applied, silica fume enhanced, fiber-reinforced, cementitious mortar

<b>Description</b>	Sikacem® 103F is a ready-to-use, non-accelerated, cementitious, silica fume enhanced, fiber-reinforced mortar with a dust control agent. Sikacem® 103F is formulated for machine applications using dry or wet process spray equipment.
<b>Where to Use</b>	Sikacem® 103F is particularly suitable for structural repairs in large area applications; for structures such as bridges, viaducts, retaining walls, parking structures, tunnels, galleries, industrial and residential buildings, piers, off-shore platforms, etc. <ul style="list-style-type: none"> <li>■ Use on grade, above, and below grade on concrete and mortar.</li> <li>■ Use on vertical, overhead and horizontal surfaces.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>■ One-component, ready to use mortar.</li> <li>■ Excellent adhesion to currently prepared, sound substrates.</li> <li>■ High compressive and flexural strength, rapid strength and development.</li> <li>■ Fiber-reinforced</li> <li>■ High density.</li> <li>■ Not a vapor barrier.</li> <li>■ Formulated to minimize dust formation.</li> <li>■ Low in rebound, extremely economical in use.</li> <li>■ Low water cement ratio, very low shrinkage.</li> <li>■ Can be troweled and screed after application.</li> </ul>
<b>Coverage</b>	Yield in service will vary according to amount of water utilized in the shotcreting process. Theoretical yield, without waste, of a 55 lb. bag is approximately 0.48 cu. ft./bag. Estimating should be based on prior experience or actual field evaluation.
<b>Packaging</b>	55 lb. multi-wall bags.

### Typical Data (Material and curing conditions @ 73F (23°C) and 100% 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.

<b>Shelf Life</b>	1 year in original, unopened bags.	
<b>Storage Conditions</b>	Store dry at 40°-95°F (4°-35°C). Condition material to 65°-75°F before using.	
<b>Color</b>	Concrete gray	
<b>Density (wet mix)</b>	137 lbs./cu.ft. (2.2 kg/l)	
<b>Compressive Strength (ASTM C-109)</b> (3 inch cubes)		
<b>2 day</b>	6,000 psi	(41.4 MPa)
<b>7 day</b>	7,000 psi	(48.3 MPa)
<b>28 day</b>	8,000 psi	(55.2 MPa)
<b>Freeze/Thaw Resistance (ASTM C-666)</b>	300 cycles	95%
<b>Rapid Chloride Permeability Testing (AASHTO T-277)</b>	Coulombs passed: less than 750 (very low)	
<b>Flexural Strength (ASTM C-78)</b>		
<b>7 day</b>	1,000 psi	(6.9 MPa)
<b>28 day</b>	1,400 psi	(9.7 MPa)
<b>Tensile Strength (ASTM C-496)</b>		
<b>7 day</b>	600 psi	(4.1 MPa)
<b>28 day</b>	750 psi	(5.2 MPa)
<b>Direct Bond Strength (pull off test) (ACI 503.R)</b>		
<b>28 day</b>	290-580 psi	(2-4 MPa) mostly concrete failure (substrate)
<b>Modulus of Elasticity</b>		
<b>Static Modulus</b> (28 days)	4.6 x 10 <sup>6</sup> psi	(32,000 MPa)
<b>Dynamic Modulus</b> (28 days)	5.8 x 10 <sup>6</sup> psi	(40,000 MPa)



**PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.**

## How to Use

### Surface Preparation

**Concrete/Mortar:** Substrate must be sound, clean, and free from oil, grease, loose material, surface contaminants and other bond-inhibiting materials. Steel reinforcement must be clean and free from any rust. Be sure repair area is not less than 1/3 in. in depth. Preparation work should be done by high pressure water blast, scabber, or other appropriate mechanical means, to obtain an exposed aggregate surface (CSP-6). Saturate surface with clean water. Substrate should be saturated surface dry (SSD) with no standing water during application. When applying on critical substrates, the use of Sika® Armatec® 110 EpoCem as a bonding agent is advised.

**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 Product Data Sheet).

### Application

**Dry Process:** Sikacem® 103F is applied by conventional dry spray shotcrete equipment. Generally, do not use equipment with high rotor capacity. Apply Sikacem® 103F in accordance with ACI 506-R85, "Guide to Shotcrete". Important factors to observe during shotcreting are nozzle distance (2-6 ft.), angle to substrate (90°F), and consistency of mortar. Immediately after application and before set, mortar consistency should be plastic, like a firm jelly.

**Wet Process:** Mixing: Conventional wet-process spray equipment such as the Mayco ST-45 or C-30HD machine should be used. Set up wet-process equipment; then add the water (approx. 5 pints per bag) directly into mixer. Start the mixer in motion and add the Sikacem® 103F mortar while continuing to mix. Mix to uniform consistency using a maximum of 6 pints of water per 55 lb. (25 kg.) bag (approx. 3 minutes).

**Application:** At time of application, surfaces should be saturated surface dry but hold no standing water. Apply Sikacem® 103F mortar by spraying or trowelling for repairing vertical or overhead surfaces. Shoot the material perpendicular to the surface. This minimizes rebound, creates the smoothest pattern (reduces 'bumps') and properly encases the rebars. The velocity of the material is sufficient if, at a distance of 18 to 24 in., the material pattern flattens out on contact with the surface and the rebars are encased. After applying the material, allow it to stiffen for about 10 minutes before removing bumpy areas with a trowel. Before applying the next layer, allow the material to reach initial set. This will take anywhere from 2 - 4 hours, depending on mix consistency, mix and ambient temperature, wind conditions and humidity. Begin and finish a given patch on the same day.

### Tooling and Finishing

A natural gun finish may be used. If a gun-finish is too rough, special finishes may be applied. Approximately 5-10 min. after initial set, excess material should be sliced off with a sharp-edged cutting screed.

The surface may then be finished to your requirements:

- broomed for a rough texture
- wood-floated for a granular texture
- steel-trowelled for a smooth finish.

As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylenes, 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.

\*Pretesting of curing compound is recommended.

### Limitations

- Application thickness: Minimum 1/3 inch (8 mm) for large areas, local 1/4 inch (6 mm) can be tolerated.
- Maximum in one layer for large areas, 2 inches (50 mm). Local applications up to 6-10 inches (150-250 mm) are possible.
- Minimum ambient and surface temperatures 40°F (4°C) and rising at the time of application.
- Do not use solvent-based curing compounds.
- 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.

**PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.**

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

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

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Product Data Sheet, product label and Safety Data Sheet which are available online at <http://usa.sika.com/> or by calling Sika's Technical Service Department at 800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instruction for each Sika product as set forth in the current Product Data Sheet, product label and Safety Data Sheet prior to product use.

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 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 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. SALE OF SIKA PRODUCTS ARE SUBJECT SIKA'S TERMS AND CONDITIONS OF SALE AVAILABLE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING 201-933-8800.

Visit our website at [usa.sika.com](http://usa.sika.com)

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

