BUILDING TRUST

PRODUCT DATA SHEET

SikaCem®-103 F

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

PRODUCT DESCRIPTION

SikaCem®-103 F is a ready-to-use, non-accelerated, cementitious, silica fume enhanced, fiber-reinforced mortar with a dust control agent. SikaCem®-103 F is formulated for machine applications using dry or wet process spray equipment.

USES

SikaCem®-103 F 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.

- Use on grade, above, and below grade on concrete and mortar.
- Use on vertical, overhead and horizontal surfaces.

CHARACTERISTICS / ADVANTAGES

- One-component, ready to use mortar.
- Excellent adhesion to currently prepared, sound substrates.
- High compressive and flexural strength, rapid strength and development.
- Fiber-reinforced
- High density.
- Formulated to minimize dust formation.
- Low in rebound, extremely economical in use.
- Low water cement ratio, very low shrinkage.
- Can be troweled and screed after application.

PRODUCT INFORMATION

Packaging	55 lb (25 kg) bag	
Appearance / Color	Gray powder	
Shelf Life	12 months from date of production if stored properly in original, unopened and undamaged sealed packaging	
Storage Conditions	Store dry at 40–95 °F (4–35 °C) Condition material to 65–75 °F before using Protect from moisture. If damp, discard material	
Density	137 lb/ft³ (2.2 kg/l)	(ASTM C-138)

TECHNICAL INFORMATION

Compressive Strength	2 days 7 days 28 days	6,000 psi (41.4 MPa) 7,000 psi (48.3 MPa) 8,000 psi (55.2 MPa)	(ASTM C-109) 73 °F (23 °C) 100 % R.H.
	* Cubes casted by spray application		
Modulus of Elasticity in Compression	28 days	$5.8x10^6$ psi (40 GPa)	(ASTM C-496)
Flexural Strength	7 days 28 days	1,000 psi (6.9 MPa) 1,400 psi (9.7 MPa)	(ASTM C-293) 73 °F (23 °C) 100 % R.H.
Tensile Strength	7 days 28 days	600 psi (4.1 MPa) 750 psi (5.2 MPa)	(ASTM C-496) 73 °F (23 °C) 100 % R.H.
Pull-Out Resistance	28 days	290-580 psi (2.0-4.0 MPa) Substrate failure	(ASTM C-1583)
	* Mortar scrubbed into substrate at 73 °F (23 °C) and 50 % R.H.		
Tensile Adhesion Strength	28 days	290–580 psi (2–4 MPa) mostly concrete failure (substrate)	(ACI 503.R) 73 °F (23 °C) 100 % R.H.
Freeze-Thaw Stability	300 cycles	95 %	(ASTM C-666)
Rapid Chloride Permeability	28 days	> 750 C	(ASTM C-1202 AASHTO T-277)

APPLICATION INFORMATION

Mixing Ratio	5-6 pts (2.4-2.8 L) per bag		
Coverage	0.48 ft^3 (0.01 m^3) per bag (Yield in service will vary according to amount of water utilized in the shotcreting process)		
Layer Thickness		**Min.**	**Max.**
	Large areas	1/3" (8 mm)	2" (50 mm)
	Local application	1/4" (6 mm)	6–10" (150–250 mm)
Ambient Air Temperature	> 40 °F (4 °C)		
Substrate Temperature	> 40 °F (4 °C)		

APPLICATION INSTRUCTIONS

SURFACE PREPARATION

- Surface must be clean and sound. Remove all deteriorated concrete, dirt, oil, grease, and other bond-inhibiting materials from the area to be repaired.
- Steel reinforcement must be clean and free from any rust.
- Be sure repair area is not less than 1/3" (8 mm) in depth.
- Preparation work should be done by high pressure water blast, scabbler or other appropriate mechanical means to obtain an exposed aggregate surface profile (CSP-6).
- To ensure optimum repair results, the effectiveness of decontamination and preparation should be assessed by a pull-off test.
- Substrate should be Saturated Surface Dry (SSD) with clean water prior to application. No standing water should remain during application.

PRIMING

- 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 PDS).

- Concrete Substrate: When applying on critical substrates, the use of Sika® Armatec® 110 EpoCem as a bonding agent is advised.

APPLICATION

- Apply SikaCem®-103 F mortar by spraying or trowelling for repairing vertical or overhead surfaces.
- Shoot perpendicular (90°) 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" (457 to 609 mm), 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.

Dry Process

- SikaCem®-103 F is applied by conventional dry spray shotcrete equipment.
- Generally, do not use equipment with high rotor capacity.
- Apply SikaCem®-103 F 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 °), and consistency of mortar.
- Immediately after application and before set, mortar consistency should be plastic, like a firm jelly.

Wet Process

- 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 (5-6 pts per bag) directly into mixer.
- Start the mixer in motion and add the SikaCem®-103 F mortar while continuing to mix.
- Mix for 3 minutes to uniform consistency.

Natural gun finish

- 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

CURING TREATMENT

- 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 lifts of mortar, leveling mortar or protective coatings.
- Moist curing should commence immediately after finishing.
- Protect freshly applied mortar from direct sunlight, wind, rain and frost.

* Pretesting of curing compound is recommended.

LIMITATIONS

- 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.
- Not a vapor barrier.

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.

OTHER RESTRICTIONS

See Legal Disclaimer.

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.

DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

0 g/l (EPA method 24)

LEGAL DISCLAIMER

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

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Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: +1-800-933-7452
Fax: +1-201-933-6225
usa.sika.com

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