

## PRODUCT DATA SHEET

# SikaEmaco<sup>®</sup>-211 SP

(formerly MEmaco S 211SP)

FIBER-REINFORCED, SILICA-FUME-ENHANCED STRUCTURAL WET- OR DRY-PROCESS SHOTCRETE

### PRODUCT DESCRIPTION

SikaEmaco<sup>®</sup>-211 SP is a one-component, fiber-reinforced repair mortar that contains an integral corrosion inhibitor. It can be applied by either the wet or dry shotcrete process.

### USES

- Interior and exterior
- Horizontal, vertical, and overhead surfaces
- Structural repair and retrofit of:
  - Bridges, tunnels, and parking garages
  - Piers, docks, and dams
  - Reservoirs and tanks
  - Water management facilities
  - Canals and aqueducts

#### Substrates

- Concrete

### CHARACTERISTICS / ADVANTAGES

- Fiber reinforced for plastic shrinkage control and reduced rebound
- Versatile, can be applied using dry or wet shotcrete process
- Very low chloride permeability and an integral corrosion inhibitor protects reinforcing steel
- Workable and easy to cut and finish when applied using a wet process
- Prepackaged quality for bag-to-bag uniformity
- NSF/ANSI Std 61 certified for drinking water systems

### APPROVALS / STANDARDS

- Cement meets ASTM C 150 standards
- Sand gradation meets ASTM C 33 and ACI 506 standards
- NSF/ANSI Std 61 certified for drinking water systems

### PRODUCT INFORMATION

<b>Chemical Base</b>	SikaEmaco <sup>®</sup> -211 SP is a one-component silica-fume-enhanced fiber-reinforced mortar containing an in	
<b>Packaging</b>	55 lb (25 kg) polyethylene-lined bags 3,300 lb (1,500 kg) bulk bags	
<b>Shelf Life</b>	55 LB BAG: 1 year when properly stored 3,300 LB BULK BAG: 3 months when properly stored	
<b>Storage Conditions</b>	Store in unopened containers in a cool, clean, dry area	
<b>Density</b>	<u>Unit Weight</u>	<u>129 lb/ft<sup>3</sup> (2,067 kg/m<sup>3</sup>)</u>

## TECHNICAL INFORMATION

<b>Abrasion Resistance</b>	Duration: 30min	Depth of wear: 0.021in (0.53 mm)	(ASTM C 779A)
	Duration: 60min	Depth of wear: 0.036in (0.91 mm)	
<b>Compressive Strength</b>	1 day: 2,500psi (17.2 MPa)	7 day: 6,000psi (41.4MPa)	28 day: 7,000psi (48.3MPa) (ASTM C 109)
	3 day dry process: 6,000psi (41.4 MPa)	3 day wet process: 5,500psi (38.0MPa)	(ASTM C 42)
	28 day dry process: 10,000psi (69.0MPa)	28 day wet process: 9,500psi (69.0MPa)	
<b>Modulus of Elasticity in Compression</b>	28 day: 4.6 x 10 <sup>6</sup> psi (31.7GPa)		(ASTM C 469)
<b>Flexural Strength</b>	1 day: 700psi (4.8MPa)	7 day: 1200psi (8.3MPa)	28 day: 1800psi (12.4MPa) (ASTM C 348)
<b>Tensile Strength</b>	Direct Tensile Bond Strength:		
	1 day: 50psi (.3MPa)	7 day: 130psi (.9MPa)	28 day: 180psi (1.2MPa) (ACI 503R, Appendix A)
<b>Splitting tensile strength</b>	1 day: 200psi (1.4MPa)	7 day: 300psi (2.1MPa)	28 day: 400psi (2.8MPa) (ASTM C 496)
<b>Slant Shear Strength</b>	Slant shear bond strength:		
	1 day: 1200psi (8.3MPa)	7 day: 2500psi (17.2MPa)	28 day: 3000psi (20.7MPa) (ASTM C 882, modified1)
<b>Shrinkage</b>	Drying shrinkage at 28 days	.08%	(ASTM C 157, modified2)
	ICRI Guideline #03733, 1 by 1 by 10" (25 by 25 by 250 mm) prism, air cured.		
<b>Rapid Chloride Permeability</b>	Rapid chloride permeability at 28 days	685 coulombs	(ASTM C 1202/AASHTO T-277)
<b>Freeze-Thaw Stability</b>	300 cycles	95% RDM	(ASTM C 666, Procedure A)

## APPLICATION INFORMATION

<b>Coverage</b>	Approximately 0.46 ft <sup>3</sup> (0.013 m <sup>3</sup> ), which will cover approximately 5.8 ft <sup>2</sup> (0.54 m <sup>2</sup> ) at a 1" (25 mm) depth excluding rebound and waste		
<b>Set Time</b>	2hrs 45min at 70° F (21° C)		(ASTM C 266)
<b>Final set time</b>	6hrs at 70° F (21° C)		(ASTM C 266)
	Results were obtained when the material was mixed with 0.8 gallons (3.0 L) of water per bag and cured at 70° F (21° C). Expect reasonable variations, depending on application methods, test methods, and curing conditions.		

## 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.

## 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 CHEMTEL at +1 (800) 255-3924 or if outside the US or Canada, +1 (813) 248-0585.

## APPLICATION INSTRUCTIONS

### NOTES ON INSTALLATION

For Best Performance

- Precondition these materials to approximately 70°F (21°C) for 24 hours before using.
- Water content should not exceed 0.9 gallons per 55 lb bag during application.
- Minimum application thickness is 3/8" (10 mm).
- Maximum application thickness is 6" (152 mm) per lift.
- Do not mix partial bags.
- Minimum ambient and surface temperatures should be 45°F (7°C) and rising at the time of application.
- For professional use only; not for sale to or use by the general public.
- Make certain the most current versions of the product data sheet and SDS are being used.
- 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 jobsite.

### SURFACE PREPARATION

1. The substrate must be structurally sound and fully cured (28 days).
2. Saw cut the perimeter of the area being repaired into a square with a minimum depth of 1/4" (6 mm).
3. The surface to be repaired must be clean, free of laitance, and saturated surface-dry (SSD) following ICRI Guideline no. 310.2 to permit proper bond.

Reinforcing Steel

1. Remove all oxidation and scale from the exposed reinforcing steel in accordance with ICRI Technical Guideline No. 310.1R.
2. For additional protection from future corrosion, coat the prepared reinforcing steel with Sikagard® P 8100 AP.

## MIXING

### Wet Process

1. Add 0.68–0.77 gallons (2.57–2.91 L) of potable water per 55 lb (25 kg) bag of SikaEmaco®-211 SP.
2. Mechanically mix using an appropriately sized forced-action mortar mixer. Pour approximately 90% of the water into the mixing container, then charge the mixer with the material. Add the remaining mix water as required.
3. Mix for 3–5 minutes to reach a homogeneous consistency.

### APPLICATION

1. Apply in accordance with ACI 506R.
2. Apply while taking proper consideration for rebound and compaction around reinforcing steel. The successful application depends primarily on the skill of the nozzleman.
3. When applying multiple lifts, scratch the preliminary lift before the initial set. Apply the succeeding lift after the preliminary lift has reached the final set. If the succeeding lift will not be immediately placed, keep the surface continually moist.
4. Cut off or level the application as required, matching the original concrete elevation.
5. In rapid-drying conditions (e.g., hot, dry, and windy weather) use Sika® Antisol® ER 50 evaporation reducer.
6. Finish the final surface as required.

### CURING TREATMENT

Wet cure for a minimum of seven days or cure with an approved curing compound compliant with ASTM C 309 or preferably ASTM C 1315.

### CLEANING OF TOOLS

Clean tools and equipment with clean water immediately after use. Cured material must be removed mechanically

## 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](http://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

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.

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