

## PRODUCT DATA SHEET

# SikaEmaco<sup>®</sup>-488 CI

(formerly MEmaco S 488CI)

SPRAYABLE, FIBER-REINFORCED STRUCTURAL REPAIR MORTAR WITH INTEGRAL CORROSION INHIBITOR

### PRODUCT DESCRIPTION

SikaEmaco<sup>®</sup>-488 CI repair mortar is a one-component, shrinkage-compensated, fiber-reinforced product that contains an integral corrosion inhibitor. It can be applied vertically or overhead by low-pressure spraying or hand troweling.

### USES

- Interior and exterior
- Vertical and overhead
- Severe service environments such as sewer, lift stations, marine structures, and water collection

#### Substrates

- Concrete
- Masonry
- Brick

### CHARACTERISTICS / ADVANTAGES

- Only requires the addition of potable water
- Achieves a tenacious bond to substrate without the need for a bonding agent
- Low-pressure sprayability improves placement speed and minimizes rebound for low-waste
- Sulfate-resistant and freeze/thaw durable for use in harsh environments
- Very low chloride permeability and an integral corrosion inhibitor protect reinforcing steel
- High early and ultimate compressive, flexural, and bond strengths for long-lasting, durable repairs
- Low shrinkage produces a stable, durable bond
- NSF/ANSI Std 61 certified for drinking water systems. (Only products bearing the NSF Mark on the product, product packaging, and/or documentation shipped with the product are Certified.)

### APPROVALS / STANDARDS

NSF/ANSI Std 61 certified for drinking water systems

### PRODUCT INFORMATION

<b>Chemical Base</b>	SikaEmaco <sup>®</sup> -488 CI is a one-component rheoplastic, silica-fume modified, fiber-reinforced repair mortar with an integral corrosion inhibitor.
<b>Packaging</b>	55 lb (25 kg) polyethylene-lined bags
<b>Shelf Life</b>	55 lb. bags: 1 year when properly stored 3,300 lb. bulk bags: 3 months when properly stored
<b>Storage Conditions</b>	Store in unopened containers in a cool, clean, dry area
<b>Density</b>	139 lb/ft <sup>3</sup> (2,275 kg/m <sup>3</sup> )

## TECHNICAL INFORMATION

<b>Compressive Strength</b>	1 day	3,500 psi (24.1 MPa)	(ASTM C 109)
	7 day	6,600 psi (45.5 MPa)	
	28 day	9,000 psi (62.1 MPa)	
<b>Modulus of Elasticity in Compression</b>	5.0 x 10 <sup>6</sup> psi (34.5) at 28 days		(ASTM C 469)
<b>Flexural Strength</b>	1 day	650 psi (4.5 MPa)	(ASTM C 348)
	7 day	1,000 psi (6.9 MPa)	
	28 day	1,300 psi (9.0 MPa)	
<b>Shrinkage</b>	<b>Drying Shrinkage</b>		(ASTM C 157, modified <sup>2</sup> )
	0.09% at 28 days		
<sup>2</sup> ICRI Guideline No. 320.2R "Guide for Selecting and Specifying Materials for Repair of Concrete Surfaces" (formally No. 03733), 1 by 1 by 10" (25 by 25 by 250 mm) prism, air cured.			
<b>Tensile Adhesion Strength</b>	<b>Direct Tensile Bond Strength</b>		
	1 day	100 psi (0.7 MPa)	(ACI 503R, Appendix A)
	7 day	175 psi (1.2 MPa)	
	28 day	300 psi (2.1 MPa)	
	<b>Splitting Tensile Strength</b>		
	1 day	350 psi (2.4 MPa)	(ASTM C 496)
7 day	500 psi (3.5 MPa)		
28 day	900 psi (6.2 MPa)		
<b>Freeze Thaw De-Icing Salt Resistance</b>	None at 50 cycles		(ASTM C 672)
<b>Sulfate Resistance</b>	< 0.10 % 6 months		(ASTM C 1012)
<b>Slant Shear Strength</b>	<b>Direct Shear Bond Strength</b>		
	1 day	350 psi (2.4 MPa)	(Michigan DOT)
	7 day	450 psi (3.1 MPa)	
	28 day	700 psi (4.8 MPa)	
	<b>Slant Shear Bond Strength</b>		
	1 day	1,500 psi (10.3 MPa)	(ASTM C 882, modified <sup>1</sup> )
7 day	2,500 psi (17.2 MPa)		
28 day	3,000 psi (20.7 MPa)		
<sup>1</sup> No epoxy-bonding agent was used.			
<b>Freeze-Thaw Stability</b>	91.0% RDM at 300 cycles		(ASTM C 666, Procedure A)
<b>Rapid Chloride Permeability</b>	Very low chloride penetrability, 100–1,000 coulombs at 28 days		(ASTM C 1202 / AASHTO T 277)

## APPLICATION INFORMATION

<b>Coverage</b>	0.45 ft <sup>3</sup> (0.013 m <sup>3</sup> ) per 55 lb (25 kg) bag		
<b>Thinner</b>	<b>Working time</b> 45 min		
<b>Set Time</b>	< 4 hours hrs		(ASTM C 266)
<b>Final set time</b>	< 7 hours		(ASTM C 266)

## 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 CHEMTREC at 1-800-424-9300, International 703-527-3887.

## APPLICATION INSTRUCTIONS

### NOTES ON INSTALLATION

- Precondition material to approximately 70 °F (21 °C) for 24 hours before using.
- Protect repairs from direct sunlight, wind, and other conditions that could cause rapid drying of material.
- 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.

### SUBSTRATE PREPARATION

1. The substrate must be structurally sound and fully cured (28 days).
2. The 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. For most applications, a CSP 4 - 10 will promote sufficient 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.

#### Reinforcing Mesh

1. In the following conditions, use a 4 by 4" (102 by 102 mm) low-gauge (10–12) mesh firmly tied into the properly prepared substrate. If repairing chloride-contaminated concrete consider using galvanized or stainless mesh. The use of galvanic anodes or

Sikagard® P 8100 AP should also be considered to protect adjacent concrete:

2. – When applying SikaEmaco®-488 CI mortar in repairs greater than 10 lineal feet (3 m) in the longest direction
3. – In overlays at depths of 1–1½" (25–38 mm) or greater
4. – For overhead applications of the same size
5. Locate the mesh no closer than 3/8" (10 mm) and no more than 1" (25 mm) from the finished surface using spacers and concrete anchors.
6. Mesh is not necessary in applications with side restraints, such as square-cut patches or areas where existing concrete reinforcement will provide adequate restraint. For depths over 2" (51 mm), consult your Sika representative.

### MIXING

1. Add 0.7–1.0 gallons (2.7–3.8 L) of potable water per 55 lb (25 kg) bag.
2. Mechanically mix using a forced-action mortar mixer of appropriate size. Pour approximately 90% of the mix water into the mixing container, and then charge the mixer with the bagged material. Add the remaining mix water as required.
3. Mix for 3–5 minutes to achieve a homogeneous consistency. For overhead applications, use a stiffer mix.

### APPLICATION

#### Hand-trowel Application

1. Dampen the surface with potable water; it must be saturated surface-dry (SSD) with no standing water.
2. With a gloved hand, scrub a small quantity of mixed material into the SSD substrate. Thoroughly key in and work the material throughout the cavity to promote bond. Do not apply more of the bond coat than can be covered with mortar before the bond coat dries.
3. Apply material in lifts of 1/4–2" (6–51 mm). Avoid featheredging. For optimum mechanical bond on successive lifts, thoroughly score each lift and allow it to reach the initial set before the next layer is applied. Placement time is 45 minutes at 70 °F (21 °C) and 50% relative humidity.
4. Trowel material to the desired finish after the initial set.
5. The recommended application range of SikaEmaco®-488 CI is from 45 to 90 °F (7 to 32 °C). Follow ACI 305 and 306 for hot or cold weather guidelines.

#### Spray Application

1. Spray application is recommended for larger repairs refer to ACI RAP 3.
2. Applicators must have a thorough knowledge of pump and spray equipment before spray-applying SikaEmaco®-488 CI. Use normal techniques of pumping water first and then a cement slurry to prime and lubricate the base (neither being applied to the repair area). Be careful not to get too far ahead of the finishing crew; SikaEmaco®-488 CI mortar stiffens rapidly after placement. Periodic cleaning of the pump may be helpful when applying large quantities.

3. SikaEmaco®-488 CI mortar may be applied on vertical or overhead surfaces in thicknesses from 3/8–2" (10 mm–51 mm). For depths over 2" (51 mm), consult your Sika representative. Achieve a thicker build by making multiple passes with the spray nozzle.
  - Can be applied vertically in a thickness up to 2" (51 mm) in a single lift.
  - Unless forming is used, the overhead application should be no more than 11/2" (38 mm) per pass. For depths greater than 11/2" (38 mm), succeeding lifts of no more than 1" (25 mm) should be used.
  - MULTIPLE LIFTS: Timing between lifts is critical and will vary with several factors, including mix consistency, mix and ambient temperature, wind conditions, humidity, and application technique. Succeeding lifts may be placed after the repair mortar has developed the initial set. Roughen or profile the preliminary lifts to ensure the adhesion of subsequent lifts. When succeeding lifts will not be applied the same day, keep the surface continually moist.

## CURING TREATMENT

### Finishing

1. After placing SikaEmaco®-488 CI mortar, level the surface immediately using a wooden float.
2. In hot, dry, or windy conditions, use Sika® Antisol® ER 50 evaporation reducer.
3. Start final finishing when the mortar has begun to set using a wooden or sponge float.

### Curing

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

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### Product Data Sheet

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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.

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