

## PRODUCT DATA

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Maintenance of  
Concrete**EMACO<sup>®</sup> S77 CI**

Flowable, structural repair mortar with integral corrosion inhibitor

**Description**

Emaco<sup>®</sup> S77 CI is a rheoplastic, flowable, shrinkage-compensated, form-and-pump repair mortar designed for preplaced aggregate applications. Emaco<sup>®</sup> S77 CI repair mortar provides high pumpability for structural repairs of columns and beams.

**Yield**

Approximately 0.50 ft<sup>3</sup> (0.013 m<sup>3</sup>), which will cover approximately 6.0 ft<sup>2</sup> (0.56 m<sup>2</sup>) at a 1" (25 mm) depth.

**Packaging**

55 lb (25 kg) multi-wall bags  
3,300 lb (1,500 kg) bulk bags  
available by special order

**Shelf Life**

18 months when properly stored

**Storage**

Store in unopened containers in a clean, dry area between 45 and 90° F (7 and 32° C).

**Features**

- Low permeability
- Contains an integral corrosion inhibitor
- Freeze/thaw and sulfate resistant
- Very flowable
- Shrinkage compensated

**Benefits**

- Resists water and chloride-ion penetration
- Ideal for wet, corrosive environments
- Durable repairs
- Excellent for form and pump or pour as well as preplaced aggregate applications
- Reduces stress at the bondline

**Where to Use**

## APPLICATION

- Horizontal and formed vertical or overhead repairing of concrete
- Columns and beams
- Preplaced aggregate repair
- Bridges, parking garages, and tunnels
- Piers, navigation locks, dams, sea walls, and other marine structures

**How to Apply****Surface Preparation**

## CONCRETE

1. Perform surface preparation in compliance with ICRI Technical Guideline No. 03730 "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion."
2. Remove all unsound or delaminated concrete, providing a minimum 1/4" (6 mm) substrate profile and 3/4" (19 mm) clearance behind corroded reinforcing steel.
3. Sawcut the perimeter of the area being patched to a minimum depth of 3/8" (10 mm) to prevent featheredges. Do not cut the reinforcement.

4. After concrete removal and before placement, mechanically abrade the concrete surface to remove all bond-inhibiting materials and to provide additional mechanical bond. Do not use a method of surface preparation that will fracture the concrete. Verify the absence of microcracking or bruising in accordance with ICRI Guideline No. 03732.

5. Unless a bonding agent will be used, presoak the prepared concrete surface to provide a saturated surface-dry (SSD) condition.

## CORRODED REINFORCING STEEL

1. Remove all oxidation and scale from the exposed reinforcing steel in accordance with ICRI Technical Guideline No. 03730 "Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion."
2. For additional protection from future corrosion, coat the prepared reinforcing steel with P24 rebar coating or install Emaco<sup>®</sup> Corr-Stops<sup>®</sup> CM galvanic anodes.

## Technical Data

### Composition

Emaco® S77 CI is a rheoplastic, cement-based, silica-fume-modified, flowable repair mortar.

### Typical Properties

PROPERTY	VALUE
<b>Unit weight,</b> lb/ft <sup>3</sup> (kg/m <sup>3</sup> )	135 (2,160)
<b>Working time,</b> hrs	1
<b>Set times,</b> hrs (ASTM C 266)	
Initial set	2
Final set	4

### Test Data

PROPERTY	RESULTS			TEST METHODS
	<b>1 Day Psi (MPa)</b>	<b>7 Day Psi (MPa)</b>	<b>28 Day Psi</b>	
<b>Direct tensile bond strength</b>				ACI 503R, Appendix A
	300 (2.1)	400 (2.8)	550 (3.8)	
<b>Slant shear bond strength</b>				ASTM C 882, modified <sup>1</sup>
	1500 (10.4)	2800 (19.3)	3100 (21.4)	
<b>Volume change, %</b>	+0.03	+0.05	+0.06	ASTM C 806
<b>Splitting tensile strength</b>				ASTM C 496
	350 (2.4)	600 (4.1)	950 (6.6)	
<b>Flexural strength</b>				ASTM C 348
	700 (4.8)	1,300 (9.0)	1,450 (10.0)	
<b>Compressive strength</b>				ASTM C 109
	3,400 (23.5)	8,000 (55.2)	11,000 (76)	
<b>Modulus of elasticity,</b> psi (GPa), at 28 Days	4.9 x 10 <sup>6</sup> (33.8)			ASTM C 469
<b>Rapid chloride permeability,</b> coulombs, at 28 Days	870			ASTM C 1202 / AASHTO T 277
<b>Freeze/thaw resistance,</b> % RDM, at 300 cycles	98			ASTM C 666
<b>Scaling resistance at 50 cycles</b>	1, very slight scaling			ASTM C 672
<b>Sulfate resistance, %</b> length change at 6 months	+0.01			ASTM C 1012

<sup>1</sup>No epoxy-bonding agent used

Results were obtained when material was mixed with 0.96 gallons (3.6 L) of water per bag and cured at 70° F (21° C). Expect reasonable variations, depending upon mixing equipment, temperature, application methods, test methods, and curing conditions.

## Mixing

1. Add 0.8 – 1.0 gallons (3.0 – 3.8 L) of potable water per 55 lb (25 kg) bag of Emaco® S77 CI repair mortar. Use a mechanical mixer with a slow-speed drill (400 – 600 rpm) and a Jiffy-type paddle or mix in an appropriately sized mortar mixer.
2. Pour approximately 90% of the mix water into the mixing container, then charge the mixer with the bagged material. Add enough water to the mixing container to obtain a reading of 4 – 6" (102 – 152 mm) using a BASF Flow Guide (approximately 0.8 – 1.0 gallons [3.0 – 3.8 L] per bag).
3. Add the remaining mix water required to obtain desired consistency. Mix for 3 – 5 minutes to achieve a homogeneous consistency. Do not mix longer than 5 minutes.
4. For applications greater than 1-1/2" (38 mm) in thickness, use preplaced aggregate or add up to 25 lbs (11.3 kg) of rounded, graded, high-density, SSD aggregate per 55 lb (25 kg) bag.

## Application

### FORMED APPLICATIONS

1. Immediately before placement, drain presoaking water from the form, leaving a saturated substrate with no excess water remaining.
2. For vertical and overhead applications, place air-relief vents at high points in the repair area to prevent voids from entrapping air and water.
3. Apply material with sufficient pressure to ensure intimate contact with the substrate.
4. A long open-time bonding agent, such as Concreative® Liquid LPL or Emaco® P24, may be used in place of a saturated substrate. In this case, place the Emaco® S77 CI before the bonding agent becomes tack free. Remove forms when sufficient strength has developed.
5. For further information, consult ACI 347R "Guide to Formwork for Concrete."

### HORIZONTAL APPLICATIONS

1. Scrub a bond coat of mixed Emaco® S77 CI into the prepared saturated surface with a stiff-bristle broom or brush. Do not dilute the bond coat with water. A long open time bonding agent such as Concreative® Liquid LPL bonding agent may be used in place of a bond coat.
2. Emaco® S77 CI repair mortar must be placed before the bond coat dries or the bonding agent surpasses its open time.
3. Apply Emaco S77 CI and level as needed to match the original concrete elevation.
4. In rapid-drying conditions (hot, dry, or windy) use Confilm® evaporation reducer.
5. Finish the final surface as required.

## Curing

Proper curing is extremely important and should be conducted in accordance with ACI 308 "Standard Practice for Curing Concrete." Curing should continue after form removal. Apply an ASTM C 309 or ASTM C 1315 compliant curing compound or moist cure for a minimum of 7 days (including time in the form).

## For Best Performance

- Precondition these materials 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.
- Minimum application thickness is 3/8" (10 mm). For applications deeper than 1-1/2" (38 mm), use preplaced aggregate or aggregate extension.
- Do not mix partial bags.
- Minimum ambient and surface temperatures should be 45° F (7° C) and rising at the time of application.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

## Health and Safety

EMACO® S77 CI

### WARNING!

Contains silica, crystalline quartz, Portland cement, limestone, calcium oxide, gypsum, magnesium oxide.

### Risks

Product is alkaline on contact with water and may cause injury to skin or eyes. Ingestion or inhalation of dust may cause irritation. Contains small amount of free respirable quartz which has been listed as a suspected human carcinogen by NTP and IARC. Repeated or prolonged overexposure to free respirable quartz may cause silicosis or other serious and delayed lung injury.

### Precautions

Avoid contact with skin, eyes and clothing. Prevent inhalation of dust. Wash thoroughly after handling. Keep container closed when not in use. DO NOT take internally. Use only with adequate ventilation. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable Federal, state and local regulations.

### First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

### Waste Disposal Method

This product when discarded or disposed of is not listed as a hazardous waste in federal regulations. Dispose of in a landfill in accordance with local regulations.

For additional information on personal protective equipment, first aid, and emergency procedures, refer to the product Material Safety Data Sheet (MSDS) on the job site or contact the company at the address or phone numbers given below.

### Proposition 65

This product contains material listed by the State of California as known to cause cancer, birth defects or other reproductive harm.

### VOC Content

0 g/L or 0 lbs/gal less water and exempt solvents.

**For medical emergencies only,  
call ChemTrec (1-800-424-9300).**

**BASF Construction Chemicals, LLC –  
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**Customer Service** 800-433-9517

**Technical Service** 800-243-6739



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