

EMACO® S66 CI

Flowable structural-repair concrete
with integral corrosion inhibitor

PRODUCT DATA

3 03930

Concrete
Rehabilitation

Description

Emaco® S66 CI is a rheoplastic, pourable, shrinkage-compensated repair concrete. It has a unique formulation that provides excellent bond, resistance to sulfates and chlorides, high electrical resistivity, low permeability, high-compressive strengths, and protection from corrosion.

Yield

Approximately 0.43 ft³ (0.012 m³), which will cover approximately 5.0 ft² (0.46 m²) at a 1" (25 mm) depth before waste.

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 at 60 to 80° F (16 to 27° C) in clean, dry conditions.

Features

- Contains an integral corrosion inhibitor
- One component
- Low permeability
- Freeze/thaw and sulfate resistant
- Abrasion resistant
- Excellent workability
- Shrinkage compensated

Benefits

- Suitable for exterior applications
- Easy mixing and handling
- Resists moisture and chloride intrusion
- Creates durable repairs
- Excellent protection from vehicular traffic
- High slump and good pumpability for formed applications
- Reduces stress at the bondline

Where to Use

APPLICATION

- Horizontal and formed vertical or overhead concrete repairs
- Bridges, parking garages, and tunnels
- Piers, navigation locks, dams, sea walls, and other marine structures
- Balconies

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 of 1/4" (6 mm) substrate profile and 3/4" (19 mm) clearance behind corroded reinforcing steel.
3. Sawcut the perimeter of the area being repaired to a minimum depth of 1" (25 mm) to prevent featheredges. Do not cut the reinforcement.

4. After removal of concrete but 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 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 to 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 Emaco® P22 or Emaco® P24 rebar coatings or install Emaco® Corr-Stops® CI galvanic anodes.

Mixing

1. Add 0.40 – 0.60 gallons (1.5 – 2.3 L) of potable water for each 55 lb (25 kg) bag of Emaco® S66 CI. Mix mechanically using a slow-speed drill (400 – 600 rpm) and a Jiffy paddle or mix in an appropriately sized mortar mixer.



Technical Data

Composition

Emaco® S66 CI is a rheoplastic cement-based silica-fume-modified flowable repair concrete.

Typical Properties

PROPERTY	VALUE
Unit weight , lb/ft ³ (kg/m ³)	142 (2,275)
Working time , min	90
Set times , hours (ASTM C 266)	
Initial set	4
Final set	6

Test Data

PROPERTY	RESULTS			TEST METHODS
	1 Day Psi (MPa)	7 Day Psi (MPa)	28 Day Psi (MPa)	
Splitting tensile strength	300 (2.1)	550 (3.8)	700 (4.8)	ASTM C 496
Flexural strength	– –	– –	770 (5.3)	ASTM C 348
Compressive strength	2,500 (17.2)	6,000 (41.4)	8,000 (55.2)	ASTM C 109
Direct tensile bond strength	– –	260 (1.8)	340 (2.3)	ACI 503R, Appendix A
Direct shear bond strength	350 (2.4)	500 (3.4)	600 (4.1)	Michigan DOT
Slant shear bond strength	– –	2,150 (14.8)	3,300 (22.8)	ASTM C 882, modified ¹
Drying shrinkage , %, at 28 days	0.06			ASTM C 157, modified ²
Modulus of elasticity , psi (GPa), at 28 days	5.90 x 10 ⁶ (40.7)			ASTM C 469
Rapid chloride permeability , coulombs, at 28 days	650			ASTM C 1202 / AASHTO T 277
Freeze/thaw resistance , % RDM, at 300 cycles	97.0			ASTM C 666, Procedure A
Scaling resistance , 50 cycles	2; slight to moderate			ASTM C 672
Sulfate resistance , %, length change at 6 months	+0.006			ASTM C 1012

¹No epoxy-bonding agent used

²ICRI Guideline No. 03733, 3 by 3 by 10" (75 by 75 by 250 mm) prism, air cured

Results were obtained when material was mixed with 0.6 gallons (2.3 L) of water per bag and cured at 70° F (21° C). Expect reasonable variations depending upon application methods, test methods, and curing conditions.

2. Pour approximately 90% of the mix water into the mixing container, then charge the mixer with the bagged concrete and integral corrosion-inhibitor material. Add the remaining mix water as required to obtain desired consistency. Add enough water to the mixing container to obtain a slump of 4 – 6" (102 – 152 mm), approximately 0.6 gallons (2.3 L) per bag. Maximum recommended slump is 7" (175 mm). Refer to Appendix A-1: Concrete Slump Test.

3. Mix until a homogeneous consistency is achieved, approximately 3 – 5 minutes. Do not mix longer than 5 minutes.

4. For applications greater than 8" (203 mm), add up to 25 lbs (11.3 kg) of 1/2 – 3/4" rounded, high-density, washed, SSD coarse aggregate for each 55 lbs (25 kg) of Emaco® S66 CI. For bulk-bag installations, refer to Appendix A-15: Bulk Bag Installation of Repair Materials.

Application

FORMED APPLICATIONS

1. Immediately before placement, drain presoaking water from the form, leaving a saturated substrate with no excess water.
2. For vertical and overhead applications, place air-relief vents at high points in the repair area to prevent voids from entrapping air.

3. Apply the repair material with sufficient pressure to ensure intimate contact with the substrate. A long open-time bonding agent like Concessive® Liquid LPL or Emaco® P24 may be used in place of a saturated substrate. In such a case, place the Emaco® S66 CI repair concrete before the bonding agent becomes tack free.
4. 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® S66 CI repair concrete into the prepared saturated surface with a stiff-bristle broom or brush. Do not dilute the bond coat with water. Apply only an amount of bond coat that can be covered with concrete before the bond coat dries. Do not retemper the bond coat.
2. A long open-time bonding agent such as Concessive® Liquid LPL or Emaco® P24 bonding adhesive may be used in place of the bond coat. Place Emaco® S66 CI repair concrete before the bond coat or bonding agent dries.
3. Place the concrete and level as needed to match the original concrete elevation. Where rapid drying conditions exist (in hot, dry, or windy conditions), use Confilm® evaporation reducer. Finish the final surface as required.

Curing

Proper curing is extremely important; conduct it in accordance with ACI 308 "Standard Practice for Curing Concrete." Curing should continue after the removal of forms. Apply a curing compound complying with the moisture-retention requirements of ASTM C 309 or ASTM C 1315 or moist cure for a minimum of 7 days (including time in the form).

For Best Performance

- Do not exceed recommended water demands.
- Protect repairs from direct sunlight, wind, and other conditions that could cause rapid drying of material.
- Precondition these materials to approximately 70° F (21° C) for 24 hours before using.
- Degussa does not warrant the performance of this product unless the instructions of this and other related Degussa documents are adhered to in all respects.
- Minimum application thickness is 1" (25 mm).
- Do not mix partial bags.
- Minimum ambient and surface temperatures should be 45° F (7° C) and rising at the time of application.
- Maximum application thickness is 8" (203 mm). For applications greater than 8", extend with coarse aggregate.
- 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 Degussa 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® S66 CI

Caution

Risks

Eye irritant. Skin irritant. Causes burns. Lung irritant. May cause delayed lung injury.

Precautions

KEEP OUT OF THE REACH OF CHILDREN. Avoid contact with eyes. Wear suitable protective eyewear. Avoid prolonged or repeated contact with skin. Wear suitable gloves. Wear suitable protective clothing. Do not breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. Wash soiled clothing before reuse.

First Aid

Wash exposed skin with soap and water. Flush eyes with large quantities of water. If breathing is difficult, move person to fresh air.

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 materials listed by the state of California as known to cause cancer, birth defects, or reproductive harm.

VOC Content

0 lbs/gal or 0 g/L.

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

Degussa Building Systems

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