



The Chemical Company

PRODUCT DATA

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Maintenance of Concrete

EMACO® T415

Rapid-strength repair mortar

Description

Emaco® T415 repair mortar is one-component high-performance cementitious product. It produces high early strengths at a wide range of temperatures and can be placed into service for standard rubber-tire traffic in as little as 2 hours (depending on temperature). Emaco® T415 meets the ASTM C 928 specification for rapid repair of concrete.

Yield

Approximately 9.6 ft³ (0.9 m³) at a 1/2" (13 mm) thickness or approximately 0.40 ft³ (0.011 m³).

With an extension of 55% aggregate 3/8" in size, the yield is approximately 0.58 ft³ (0.016 m³).

For estimating purposes, 46 bags of Emaco® T415 repair mortar plus 1,380 lbs of clean, coarse 3/8" SSD aggregate yields approximately 1 yd³ (60 bags of Emaco® T415 repair mortar plus 820 kg of 9.5 mm SSD aggregate yields approximately 1 m³).

Packaging

55 lb (25 kg) multi-wall bags

Shelf Life

6 months when properly stored

Storage

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

Features

- Fast curing
- Wide temperature application range (20 to 85° F [-7 to 29° C])
- One component
- Rapid high early strength (1,500 psi [10 MPa] in 2 hours)
- Excellent bond
- Resistant to damage caused by freeze/thaw cycles
- Extendable up to 55% by weight for deep patches

Benefits

- Can be coated with epoxy within 4 hours
- Reduces dependency on weather
- Just add water and mix
- Rapidly returns repaired areas to service
- No bonding agent required
- Usable in most environments
- Economical repairs

Where to Use

APPLICATION

- Concrete floor repairs
- Full-depth patching
- Formed vertical repairs requiring minimal downtime or quick coating
- Horizontal patching
- Heavy industrial repairs
- Concrete pavement-joint repairs

LOCATION

- Highway repairs
- Parking structure decks and ramps
- Wastewater-treatment facilities
- Truck docks

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.



Technical Data

Composition

Emaco® T415 contains modified cement, aggregate, and additives.

Typical Properties

PROPERTY	VALUE
Water % , by weight	7.9
Setting time , min (ASTM C 266), at 72° F (22° C)	
Initial	14 – 21
Final	20 – 36

Test Data¹

PROPERTY	RESULTS			TEST METHODS
Compressive strength , psi (MPa), at 70° F (21° C)				ASTM C 109
2 hrs	1,500 (10)			
24 hrs	4,500 (30)			
7 days	8,000 (55)			
28 days	9,000 (62)			
	1 Day Psi (MPa)	7 Day Psi (MPa)	28 Day Psi (MPa)	
Flexural strength	850 (5.9)	1,000 (6.9)	1,100 (7.6)	ASTM C 348
Splitting tensile	850 (5.9)	1,200 (8.3)	1,300 (9.0)	ASTM C 496
Slant shear bond	2,500 (17)	2,900 (20)	3,100 (21.4)	ASTM C 882
Direct shear bond	200 (1.4)	350 (2.4)	375 (2.6)	Michigan DOT
Direct tensile bond	150 (1.0)	190 (1.3)	300 (2.1)	BASF method
Modulus of elasticity , psi (GPa)	3.8 x 10 ⁶ (26)		4.7 x 10 ⁶ (32)	
Abrasion resistance , in (cm) of wear, 28-day, air-cured sample				ASTM C 779 A
30 min	0.0110 (0.0275)			
60 min	0.0260 (0.0650)			
Freeze/thaw resistance , % RDM	98.3			ASTM C 666 A
Rapid chloride permeability² , coulombs	960 (very low)			AASHTO-T277 / ASTM C 1202
Scaling resistance , weight loss, lb/ft ²				ASTM C 672
25 cycles	CaCl ₂ : 0.003	NaCl: 0.067		
50 cycles	CaCl ₂ : 0.005	NaCl: 0.084		

¹Typical results from air cured samples.

²Typical results from 3 days moist-cured and 39 days air-cured samples.

Results were obtained when material was mixed with 0.52 gallons (2 L) of water per bag and cured at 72° F (22° C). Expect reasonable variations, depending upon mixing equipment, temperature, application methods, test methods, and curing conditions.

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® P24 rebar coating or install Corr-Stops® CM galvanic anodes.

Mixing

1. Use a minimum 1/2" slow-speed drill and mixing paddle or an appropriately sized mortar mixer. Do not mix by hand.
2. Allow approximately 10 minutes to mix, place, and finish Emaco® T415 repair mortar at 72° F (22° C).
3. Pour 1/2 gallon (1.9 L) of clean water per bag of Emaco® T415 into mixer.

4. Add the powder to the water and mix approximately 3 minutes. Add small amounts of additional water as needed only after the first 2 minutes of mixing. No more than 1 pint of additional water per bag should be required to achieve a flowable mortar. Mix an additional 2 minutes after adding extra water.
5. Use neat material for patches less than 1" (25 mm) in depth. Do not use Emaco® T415 and Emaco® T430 for patches less than 1/2" (13 mm) deep.

6. For deeper patches, a 55 lb (25 kg) bag of Emaco® T415 or Emaco® T430 may be extended by adding up to 30 lbs (13.6 kg) of thoroughly washed, SSD, sound, non (ASR) reactive 1/4 – 1/2" (6 – 13 mm) rounded aggregate. When using angular aggregate, reduce the maximum amount added to 25 lbs (11.4 kg) to obtain the proper workability.

Application

1. After removing all standing water, thoroughly scrub a thin layer of bond coat into the saturated surface with a stiff-bristled broom or brush. Do not dilute the bond coat with water. A suitable bonding agent may be used instead. Do not apply more of this bond coat than can be covered with mortar before the bond coat dries. Do not retemper the bond coat.
2. Immediately place the repair mortar from one side of the prepared area to the other. Work the material firmly into the bottom and sides of the patch to ensure good bond. Level the Emaco® T415 mortar and screed it to the elevation of the existing concrete. Apply the appropriate finish.
3. The application range of Emaco® T415 is from 20 to 85° F (-7 to 29° C). Follow ACI-recommended concreting practices for hot or cold weather.
4. For temperatures above 85° F (29° C), use Emaco® T430 in place of Emaco® T415.

Curing

If a topcoat will not be applied over Emaco® T415, wet cure for a minimum of 1 day, followed by the application of an ASTM C 309 or ASTM C 1315-compliant curing compound. Wet curing for longer than 1 day, even up to 28 days, minimizes shrinkage and cracking and improves physical properties.

TOPCOATING

1. BASF has a wide range of polymer flooring products for topcoating. Contact your local representative for more information.
2. For epoxy systems, allow 4 hours at 72° F (22° C) before topcoating. For polyester or vinyl ester systems, allow to cure 24 hours at 72° F (22° C) before priming and topcoating. For information on surface preparation, refer to the relevant product bulletin.

Clean Up

Use water to remove repair mortar as soon as possible from tools and mixing equipment. Cured material can only be removed mechanically. Periodically clean tools and equipment during application.

For Best Performance

- Minimum application thickness is 1/4" (6 mm).
- Do not use where applications require featheredging.
- Low material and placement temperatures may accelerate setting times. Increased mixing time with higher shear may lessen this phenomenon.
- Precondition these materials to approximately 70° F (21° C) for 24 hours before using.
- Use Confilm® evaporation reducer to protect repairs from direct sunlight, wind, and other conditions that could cause rapid drying of material.
- 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® T415

Caution

Contains silica, crystalline quartz, fly ash, Portland cement, limestone.

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).**

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