**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 ft\(^2\) (0.9 m\(^2\)) at a 1/2" (13 mm) thickness or approximately 0.40 ft\(^3\) (0.011 m\(^3\)). With an extension of 55% aggregate 3/8" in size, the yield is approximately 0.58 ft\(^3\) (0.016 m\(^3\)).

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

### 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**


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

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water %, by weight</td>
<td>7.9</td>
</tr>
</tbody>
</table>

Setting time, min
(ASTM C 266), at 72° F (22° C)
Initial 14 – 21
Final 20 – 36

Test Data¹

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>RESULTS</th>
<th>TEST METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength, psi (MPa), at 70° F (21° C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 hrs</td>
<td>1,500 (10)</td>
<td>ASTM C 109</td>
</tr>
<tr>
<td>24 hrs</td>
<td>4,500 (30)</td>
<td></td>
</tr>
<tr>
<td>7 days</td>
<td>8,000 (55)</td>
<td></td>
</tr>
<tr>
<td>28 days</td>
<td>9,000 (62)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1 Day</th>
<th>7 Day</th>
<th>28 Day</th>
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<tbody>
<tr>
<td></td>
<td>Psi</td>
<td>Psi</td>
<td>Psi</td>
</tr>
<tr>
<td></td>
<td>(MPa)</td>
<td>(MPa)</td>
<td>(MPa)</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>850 (5.9)</td>
<td>1,000 (6.9)</td>
<td>1,100 (7.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Splitting tensile</td>
<td>850 (5.9)</td>
<td>1,200 (8.3)</td>
<td>1,300 (9.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slant shear bond</td>
<td>2,500 (17)</td>
<td>2,900 (20)</td>
<td>3,100 (21.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct shear bond</td>
<td>200 (1.4)</td>
<td>350 (2.4)</td>
<td>375 (2.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Direct tensile bond</td>
<td>150 (1.0)</td>
<td>190 (1.3)</td>
<td>300 (2.1)</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Modulus of elasticity, psi (GPa)</td>
<td>3.8 x 10⁶ (26)</td>
<td>4.7 x 10⁶ (32)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abrasion resistance, in (cm) of wear, 28-day, air-cured sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 min</td>
</tr>
<tr>
<td>60 min</td>
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</tbody>
</table>

| Freeze/thaw resistance, % RDM | 98.3 | ASTM C 666 A |
| Rapid chloride permeability¹, coulombs (very low) | 960 | AASHTO-T277 / ASTM C 1202 |

Scaling resistance, weight loss, lb/ft²

<table>
<thead>
<tr>
<th>25 cycles</th>
<th>50 cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>CaCl: 0.003</td>
<td>CaCl: 0.005</td>
</tr>
<tr>
<td>NaCl: 0.067</td>
<td>NaCl: 0.084</td>
</tr>
</tbody>
</table>

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.

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.
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 lesson 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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