

# EMACO® T415

*Rapid strength repair mortar*

## DESCRIPTION:

EMACO® T415 repair mortar is based on new high performance cement technology resulting in high early strengths at a wide range of temperatures. This one component product can be placed into service in as little as two hours for standard rubber tire traffic. EMACO T415 repair mortar offers versatile, durable repairs that can be rapidly returned to service.

## RECOMMENDED FOR:

- Highway overlays and repairs
- Parking structure deck and ramp repairs
- Concrete floor repairs
- Full depth patching repairs
- Heavy industrial repairs
- Concrete pavement joint repairs
- Wastewater treatment facility repairs
- Truck dock repairs

## FEATURES/BENEFITS:

- Allows applications of an epoxy coating within 4 hours
- Easy to use; just add water and mix
- Wide temperature use range – from 20 to 85 °F (-7 to 29 °C)
- Rapid high early strength – over 2,000 psi in two hours
- Excellent bond – no bonding agent required
- Resistant to damage caused by freeze/thaw cycles
- Meets ASTM C-928 for very rapid repair
- Ample working time for a rapid repair mortar
- Economical with the added capability to extend up to 55% by weight for deep patches

## PACKAGING/ESTIMATING:

EMACO T415 repair mortar is packaged in 55 lb (25 kg) moisture-resistant bags.

One 55 lb (25 kg) bag of EMACO T415 repair mortar mixed with the required water will cover approximately 9.6 ft<sup>2</sup> (0.9 m<sup>2</sup>) at a 1/2 in. (13 mm) thickness. The yield is approximately 0.40 ft<sup>3</sup> (0.011 m<sup>3</sup>). With an extension of 55% aggregate 3/8 in. in size, the yield is approximately 0.58 ft<sup>3</sup> (0.016 m<sup>3</sup>).

For estimating purposes, 46 bags of EMACO T415 repair mortar plus 1380 lb of clean coarse 3/8 in. SSD aggregate yields approximately 1 yd<sup>3</sup> (57 bags of EMACO T415 repair mortar plus 770 kg of 9.5 mm SSD aggregate yields approximately 1 m<sup>3</sup>).

## PERFORMANCE DATA<sup>1</sup>:

% water by weight 8.0

### Setting Time

(ASTM C-266; @ 72 °F (22 °C) +/- 2 °)

Initial: 14 to 21 minutes

Final: 20 to 36 minutes

### Compressive Strength psi (MPa)

(ASTM C-109)

|        | @ 50 °F (10 °C) | 70 °F (21 °C) | 85 °F (29 °C) |
|--------|-----------------|---------------|---------------|
| 2 h    | 1,300 (9)       | 2,400 (17)    | 2,600 (18)    |
| 24 h   | 4,800 (33)      | 6,300 (43)    | 6,500 (45)    |
| 7 day  | 7,200 (50)      | 8,500 (59)    | 9,000 (62)    |
| 28 day | 9,000 (62)      | 10,000 (69)   | 10,000 (69)   |

|  | 1 Day<br>psi<br>(MPa) | 7 Days<br>psi<br>(MPa) | 28 Days<br>psi<br>(MPa) |
|--|-----------------------|------------------------|-------------------------|
| <b>Flexural Strength</b><br>(ASTM C 348) | 850<br>(5.9)          | 1,000<br>(6.9)         | 1,100<br>(7.6)          |

|  |              |                |                |
|--|--------------|----------------|----------------|
| <b>Splitting Tensile</b><br>(ASTM C 496) | 850<br>(5.9) | 1,200<br>(8.3) | 1,300<br>(9.0) |
|--|--------------|----------------|----------------|

|   |               |               |                 |
|---|---------------|---------------|-----------------|
| <b>Slant Shear Bond</b><br>(ASTM C 882) | 2,500<br>(17) | 2,900<br>(20) | 3,100<br>(21.4) |
|---|---------------|---------------|-----------------|

|  |              |              |              |
|--|--------------|--------------|--------------|
| <b>Direct Shear Bond</b><br>(Michigan DOT) | 200<br>(1.4) | 350<br>(2.4) | 375<br>(2.6) |
|--|--------------|--------------|--------------|

|   |              |              |              |
|---|--------------|--------------|--------------|
| <b>Direct Tensile Bond</b><br>(MB Method) | 150<br>(1.0) | 190<br>(1.3) | 300<br>(2.1) |
|---|--------------|--------------|--------------|

|  | 1 Day<br>psi (GPa) | 28 Days<br>psi (GPa) |
|--|--------------------|----------------------|
| <b>Modulus of Elasticity</b><br>(psi x 10 <sup>6</sup> ) | 3.8 (26)           | 4.7 (32)             |

|   |                                |
|---|--------------------------------|
| <b>Abrasion Resistance</b><br>(ASTM C-779-A, 28 day air cured sample) | [inches (centimeters) of wear] |
| 30 minutes  | 0.0110 in. (0.0275 cm)         |
| 60 minutes  | 0.0260 in. (0.0650 cm)         |

|   |  |
|---|--|
| <b>Freeze/Thaw Resistance</b><br>(ASTM C-666-A) | Retained 98.3% of original dynamic modulus |
|---|--|

|   |                         |
|---|-------------------------|
| <b>Rapid Chloride Permeability<sup>2</sup></b><br>(AASHTO - T277/ASTM C-1202) | 960 coulombs (very low) |
|---|-------------------------|

### Scaling Resistance

|              |                        |                    |
|--------------|------------------------|--------------------|
| (ASTM C-672) | Weight Loss ASTM C-928 | lb/ft <sup>2</sup> |
| 25 cycles    | CaCl <sub>2</sub>      | 0.003 NaCl 0.067   |
| 50 cycles    | CaCl <sub>2</sub>      | 0.005 NaCl 0.084   |

<sup>1</sup> Typical results from air cured samples.

<sup>2</sup> Typical results from 3 days moist cured and 39 days air cured samples.

*The following information regarding surface preparation, mixing, application and curing is provided as a brief overview. For detailed instructions before use of this product, reference the EMACO T415 Installation Bulletin.*

## **SURFACE PREPARATION:**

Prepare the area to be repaired by square cutting the edges and removing all unsound concrete. The base concrete must be roughened to provide mechanical bond, and dampened with water. After removing all standing water, apply a bond scrub coat to the prepared surface. Thoroughly scrub a thin layer of mixed EMACO T415 repair mortar into the saturated surface with a stiff bristle broom or brush. Do not apply more of this bond coat than can be covered with mortar before the bond coat dries. Do not retemper this bond coat.

## **MIXING:**

Locate the mixing operation close to the area to be repaired. At room temperature [72 °F (22 °C)] there is approximately 10 minutes to mix, place and finish EMACO T415 repair mortar.

Pour 0.5 gal (1.9 L) of clean water per bag of EMACO T415 repair mortar into mixer. Add aggregate, if necessary, for deep patches. (If damp aggregate is used, reduce the water content accordingly). Add EMACO T415 repair mortar; mix approximately 3 minutes. Add small amounts of additional water as needed only after the first two minutes of mixing. No more than one pint of additional water per bag should be required to achieve a flowable mortar. Mix one additional minute after adding extra water. Only mix quantities that can be placed in 10 minutes or less.

## **APPLICATION:**

EMACO T415 repair mortar should be used in patches 1/4 in. (6 mm) or greater in depth. **EMACO T415 repair mortar should be extended when used in patches 1 in. (25 mm) in depth or greater.**

Immediately place the properly mixed EMACO T415 repair mortar into the prepared area from one side to the other. As the job proceeds, work the material firmly into the bottom and sides of the patch to assure good bond. Level the EMACO T415 mortar and screed to the elevation of the existing concrete.

After the EMACO T415 repair mortar has hardened, abrasive blast or scarify the surface to achieve an appearance similar in texture to 40 - 60 grit sandpaper. Allow EMACO T415 repair mortar to cure sufficiently before topcoating. For epoxy systems, at 77 °F (22 °C) allow 4 hours and for polyester/ vinyl ester systems, allow EMACO T415 repair mortar to cure 24 hours before topcoating.

**Application Temperature Range:** 20 to 85 °F (-7 to 29 °C).

**Cold Temperatures:** 20 to 40 °F (-7 to 4 °C)

EMACO T415 repair mortar will harden at temperatures as low as 20 °F (7 °C). Use of ACI recommended cold weather concreting practices, such as warming the substrate, using warm water, and insulating the patch will accelerate the strength development. Do not use antifreeze or accelerators.

**Hot Temperatures:** 75 to 85 °F (24 to 29 °C)

Keep EMACO T415 repair mortar cool. Mixing with ice water is recommended to extend working time. In windy conditions care should be taken to protect exposed surfaces of freshly placed EMACO T415 repair mortar from premature drying. Use of CONFILM® is recommended.

## **CURING:**

All physical performance data is based on air cured samples. For maximum performance and minimal shrinkage, wet curing for a minimum of one day followed by the application of MASTERKURE® or MASTERKURE 200W curing compounds is recommended. Wet curing for periods longer than one day, even up to 28 days, minimizes shrinkage and cracking and improves physical properties.

## **LIMITATIONS:**

- Minimum application thickness is 1/4 in. (6 mm).
- Don't use where application requires featheredging.

## **RELATED BULLETINS:**

Material Safety Data Sheet EMACO— T415  
Installation Bulletin (7I51) #CP214 — EMACO T415  
Specification Bulletin (7S51) #CP016 — EMACO T415

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