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Technical Data Guide

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Maintenance of Concrete

MasterEmaco® T 545 and T 545HT

Very rapid-setting chemical action mortar

FORMERLY SET® 45 AND SET® 45 HW

PACKAGING
50 lb (22.6 kg) polyethylene-lined bags

YIELD
A 50 lb (22.6 kg) bag of mixed with the required amount of water produces a volume of approximately 0.39 ft^3 (0.011 m^3); 60% extension using ½" (13 mm) rounded, sound aggregate produces approximately 0.58 ft^3 (0.016 m^3).

STORAGE
Store in unopened containers in cool, clean, dry conditions

SHELF LIFE
12 months when properly stored

VOC CONTENT
0 g/L less water and exempt solvents

DESCRIPTION
MasterEmaco T 545 is a one-component magnesium phosphate-based mortar. Offered in two formulations: T 545 for ambient and substrate temperatures below 85° F (29° C) and T 545 HT for ambient and substrate temperatures ranging from 85 to 100° F (29 to 38° C).

PRODUCT HIGHLIGHTS
- Single component to just add water and mix
- Reaches 2,000 psi compressive strength in 1 hour to rapidly return repairs to service
- Takes rubber tire traffic in 45 minutes
- Wide temperature use range from below freezing to hot weather exposures
- Very low drying shrinkage for improved bond to concrete for repair and anchoring applications
- Resistant to freeze/thaw cycles and deicing chemicals so it is usable in most environments
- Air cure only, no wet curing compounds required
- Coefficient of thermal expansion similar to Portland cement concrete for more permanent repairs
- Higher sulfate resistance than conventional mortars

APPLICATIONS
- Interior and exterior
- Horizontal and formed vertical or overhead repairs
- Applications requiring high early-strength gain
- Structural concrete repairs
- Partial and full-depth repairs
- Cold temperature repairs
- Grouting applications such as anchor bolts, rebar, dowel rods and precast applications

SUBSTRATES
- Concrete

HOW TO APPLY

SURFACE PREPARATION
1. Concrete must be structurally sound and fully cured (28 days).
2. Saw cut the perimeter of the area being repaired into a square with a minimum depth of ½" (13 mm).
3. Refer to current ICRI Guideline no. 310.2R for surface prep requirements to permit proper bond.
4. Any surface carbonation in the repair area will inhibit chemical bonding. Apply a pH indicator to the prepared surface to test for carbonation. If carbonation is present, abrade surface to a depth that is not carbonated.

MIXING
1. MasterEmaco T 545 must be mixed, placed, and finished within 10 minutes in normal temperatures (71° F [21° C]). Only mix quantities that can be placed in 10 minutes or less.
2. Do not deviate from the following sequence; it is important for reducing mixing time and producing a consistent mix. Use a minimum ½" slow-speed drill and mixing paddle or an appropriately sized forced-action mortar mixer. Do not mix by hand.

Technical Data

Composition

MasterEmaco T 545 is a magnesium-phosphate patching and repair mortar.

Test Data

PROPERTY	RESULTS			TEST METHOD
Typical Compressive Strengths*, psi (MPa)				ASTM C 109, modified
	Plain Concrete 72° F (22° C)	**T 545 72° F (22° C)**	**T 545 36° F (2° C)**	**T 545 HT 95° F (35° C)**
1 hour	—	2,000 (13.8)	—	—
3 hour	—	5,000 (34.5)	—	3,000 (20.7)
6 hour	—	5,000 (34.5)	1,200 (8.3)	5,000 (34.5)
1 day	500 (3.5)	6,000 (41.4)	5,000 (34.5)	6,000 (41.4)
3 day	1,900 (13.1)	7,000 (48.3)	7,000 (48.3)	7,000 (48.3)
28 day	4,000 (27.6)	8,500 (58.6)	8,500 (58.6)	8,500 (55.2)
Note: Only T 545 formula, tested at 72° F (22° C), obtains 2,000 psi (13.8 MPa) compressive strength in 1 hour.				
Modulus of Elasticity, psi (MPa)				ASTM C 469
		7 days	**28 days**	
MasterEmaco T 545		4.18×10^6 (2.88×10^4)	4.55×10^6 (3.14×10^4)	
MasterEmaco T 545 HT		4.90×10^6 (3.38×10^4)	5.25×10^6 (3.62×10^4)	
Freeze/thaw durability test, % RDM, 300 cycles, for MasterEmaco T 545 and T 545 HT			80	ASTM C 666, Procedure A (modified**)
Scaling resistance to deicing chemicals, MasterEmaco T 545 and T 545 HT				ASTM C 672
5 cycles			0	
25 cycles			0	
50 cycles			1.5 (slight scaling)	
Sulfate resistance				ASTM C 1012
MasterEmaco T 545 length change after 52 weeks, %			0.09	
Type V cement mortar after 52 weeks, %			0.20	
Typical setting times, min, for MasterEmaco T 545 at 72° F (22° C), and MasterEmaco T 545 HT at 95° F (35° C)				Gilmore ASTM C 266, modified
Initial set			9–15	
Final set			10–20	
Coefficient of thermal expansion,*** both MasterEmaco T 545 and T 545 HT				CRD-C 39
Hot Weather coefficients			7.15×10^{-6}/° F (12.8×10^{-6}/° C)	
Flexural Strength, psi (MPa), 3 by 4 by 16" (75 by 100 by 406 mm) prisms, 1 day strength,				ASTM C 78, modified
MasterEmaco T 545			550 (3.8)	
MasterEmaco T 545 with ⅜" (9 mm) pea gravel			600 (4.2)	
MasterEmaco T 545 with ⅜" (9 mm) crushed angular noncalcareous hard aggregate			650 (4.5)	

* All tests were performed with neat material (no aggregate)

**Method discontinues test when 300 cycles or an RDM of 60% is reached.

***Determined using 1 by 1 by 11" (25 mm by 25 mm by 279 mm) bars. Test was run with neat mixes (no aggregate). Extended mixes (with aggregate) produce lower coefficients of thermal expansion.

Test results are averages obtained under laboratory conditions. Expect reasonable variations.

3. Pour potable water into mixer. Use a maximum of 4 pts (1.9 L) of water per 50 lb (22.6 kg) bag of MasterEmaco T 545. Do not deviate from the recommended water content.
4. Add the powder to the water and mix for approximately 1–1½ minutes.
5. Use neat material for repairs from ½–2" (13–51 mm) in depth. For deeper repairs, extend a 50 lb (22.6 kg) bag of MasterEmaco T 545 HT by adding up to 30 lbs (13.6 kg) of properly graded, dust-free, hard, rounded aggregate or non-calcareous crushed angular aggregate, not exceeding ½" (13 mm) in accordance with ASTM C 33, #8 (Test aggregate for fizzing with 10% HCl). If aggregate is damp, reduce water content accordingly. Special procedures must be followed when angular aggregate is used. Contact your local BASF representative for more information.

APPLICATION

1. Immediately place the mixture onto the properly prepared substrate. Work the material firmly into the bottom and sides of the patch to ensure good bond.
2. Level the MasterEmaco T 545 and screed to the elevation of the existing concrete. Minimal finishing is required.

CURING

No curing is required, but protect from rain immediately after placing. Liquid-membrane curing compounds or plastic sheeting may be used to protect the early surface from precipitation, but never wet cure.

FOR BEST PERFORMANCE

- Color variations are not indicators of abnormal product performance.
- MasterEmaco T 545 will not freeze at temperatures above -20° F (-29° C) when appropriate precautions are taken.
- Do not add sand, fine aggregate, or Portland cement.
- Do not use MasterEmaco T 545 for repairs less than ½" (13 mm) deep. For deep repairs, use MasterEmaco T 545 HT formula extended with aggregate, regardless of the temperature. Consult your BASF representative for further instructions.
- Do not use limestone aggregate.
- Do not deviate from the recommended water content printed on the bag.
- 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 for the first three hours.
- When mixing or placing in a closed area, provide adequate ventilation.
- Do not use as a precision machinery grout.
- When using in contact with galvanized steel or aluminum, consult your local BASF sales representative.
- Do not mix partial bags.
- For professional use only; not for sale to or use by the general public.
- Make certain the most current versions of product data sheet and SDS are being used; visit www.master-builders-solutions.BASF.us to verify the most current versions.
- 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, SAFETY AND ENVIRONMENTAL

Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.basf.us, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed. **For medical emergencies only, call ChemTrec® 1(800) 424-9300.**

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