



REMR MATERIAL DATA SHEET CM-PC-1.12

CONCRETE PATCHING MATERIAL: CEILCOTE 665 EPOXY MORTAR

(Supersedes previously issued CM-PC-1.12)

1. NAME

Ceilmcote 665 Epoxy Mortar

2. MANUFACTURER

Master Builders, Inc.
23700 Chagrin Boulevard
Cleveland, OH 44122
Telephone: (216) 831-5500

3. DESCRIPTION

Ceilmcote 665 Epoxy Mortar is fast curing. Its outstanding features are its unusually high tolerance for moisture and its ability to cure at low temperatures. This mortar also exhibits a high compressive strength, excellent adhesion to concrete or steel, is not affected by oils, and is resistant to most chemicals in moderate concentrations.

4. USES

Ceilmcote 665 is specifically formulated for patching large cracks and filling voids in concrete, structures, and machinery foundations. The material is designed for trowel application on either horizontal or vertical surfaces.

Typically, it is used to repair concrete bridge decks, concrete walls and tanks, compressor foundations, and for filling cracked concrete slabs. Also, it is used to bond posttensioned beams and precast piles.

5. MANUFACTURER'S TECHNICAL DATA

Physical properties:

Compressive strength 10,000 psi
(ASTM C 579-75 Method B) (70 MPa)

Flexural strength 4,000 psi
(ASTM C 580-74) (28 MPa)

Tensile bond to sandblasted steel (Primed with 680 Primer/Saturant) 3,500 psi
(24 MPa)

Tensile bond to concrete Stronger than concrete

The preceding information does not constitute a direct or implied guarantee or warranty of satisfactory performance or of fitness for a particular use or purpose.

Chemical resistance: Ceilmcote 665 Epoxy Mortar resists attack from spillage of dilute nonoxidizing mineral acids and salts, caustics, dilute oxidizing acids and salts, plus most organics and solvents. For more specific information, contact Master Builders.

Shelf life: The shelf life of 665 Mortar components is 18 months (minimum) when stored in unopened containers between 40° and 90° F. The components should be between 70° and 80° F for best handling and curing. Components should be kept dry and in closed containers prior to use.

6. MANUFACTURER'S GUIDANCE FOR APPLICATION

Preparation: Remove excessively damaged concrete, and vacuum dust and dirt from the area to be repaired. The repair surface must be free of contaminants such as oil and solvent. Ceilcote 665 Epoxy Mortar will cure in a wet environment, but the best results are obtained with dry surfaces.

Mixing: Ingredients are premeasured. The thixotropy of the epoxy mortar is contained in the liquid. Under no circumstances should solvent or any other material be used for thinning the liquid. The amount of liquid used may be varied to suit field conditions. If a repair material with less viscosity and thixotropy is required, Ceilcote 647 Repair Grout should be used. Refer to manufacturer's Bulletins 9-1.8 and 9.1.8-1.

Pour the can of Hardener No. 7 into the pail of 665 Liquid. Using a low-speed drill with mixing paddle, mix the hardener and liquid (approximately 3 min). Mix the sand with the liquid/hardener in a mortar box until all of the sand is completely wet.

The mixing ratio by volume is 2:1 Resin:Hardener.

Locally available sands may be used if desired. Ideally, the sand should have the following gradation:

<u>Steve No.</u>	<u>% Retained On</u>
30	0 - 5
40	10 - 14
50	25 - 30
70	26 - 31
100	20 - 22
140	6 - 4
Pan	0 - 2

Other gradations may be used; however, more or less sand may have to be used in a unit.

Placement: To obtain a maximum bond to steel surfaces, use a wet coat of primer. Wet primer can also be used on concrete surfaces. For maximum bond, apply the epoxy mortar before the primer is fully cured. (Allow the primer to cure 1/2 hr before applying the epoxy mortar).

Ceilcote 665 Epoxy Mortar may be troweled into place; make certain the mortar is pushed into all cracks and crevices. Repair smaller cracks with Ceilcote 647 Repair Grout.

Cleaning equipment: Ceilcote 665 Mortar is not easily removed with water. Use any of the following for cleaning before material hardens: Ceilcote T-435 Solvent, Ketone Solvents, Lacquer Thinner, or Xylol.

Cure time vs temperature: Temperature affects the working time and curing time of 665 Epoxy Mortar. At 70° F the mortar has an approximate working time of 1/2 hr. Warmer temperature will shorten this time; cooler will lengthen. Temperatures vary so radically (day vs night, day vs day) that field judgment must be used as the final measurement of cure and working time.

Safety:

- a. Warning - combustible liquid. Keep away from heat, sparks, and open flame. Do not permit welding within fifty feet of working area or directly above. Post "No Smoking" signs in the working area.
- b. Mix in a well-ventilated area. Avoid excessive breathing of vapors. In enclosed areas or where ventilation is poor, use an approved air mask and adequate safety precautions to prevent fire or explosion.
- c. Wear protective gloves, clothing, and goggles when mixing or pouring.

- d. Wear eye protection at all times. If the material gets in eyes, flush immediately (seconds count) with water for 15 min and call a physician immediately.
- e. The epoxy is not to be taken internally. If swallowed, call a physician immediately. Do not induce vomiting.
- f. Since the material contains epoxy resin and polyamine hardener, avoid direct contact with skin or mucous membranes. Epoxy resins cause skin irritation on prolonged contact and may cause sensitization. Hardeners can cause skin irritation, dermatitis, or other allergic responses.
- g. Wear gloves and protective clothing. In case of skin contact,

wash immediately with soap and water. Remove and wash contaminated clothing before reuse. Change clothing daily to prevent over contamination of resin and hardener.

- h. Hardeners with red Ceilcote labels must never be combined with hardeners with yellow Ceilcote labels. They will react violently if mixed together. Do not store packages with red labels near packages with yellow labels. Use only in accordance with manufacturer's instructions. Note: Dept. of Transportation diamond labels are not color coded as per the above warning. They are for industrial use and professional application only. They are not for sale to the general public.

7. CORPS OF ENGINEER'S EVALUATION

This material was evaluated by Singleton Laboratories, TVA, through a support agreement with the U.S. Army Engineer Waterways Experiment Station.*

<u>Property</u>	<u>Test Method</u>	<u>Results</u>
Compressive strength, psi	ASTM C 109	11,120
Slant-shear bond strength, psi	ASTM C 882	
Dry surfaces		3,230
Wet surfaces		1,890
Bond capacity in direct tension, psi	**	320
Bond capacity under flexural stress, psi	ASTM C 293	2,660
Underwater abrasion loss, %	CRD-C 63	-1
Resistance to cycles of freezing and thawing, % of original weight after 312 cycles	ASTM C 666 Procedure A	100
Impact resistance, in.-lb	--	1,133
Coefficient of thermal expansion, millionths/°F	--	13.6

* Best, Floyd J., and McDonald, James E. 1990. "Spall Repair of Wet Concrete Surfaces," Technical Report REMR-CS-25, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

** Causey, F. E. 1984. "Preliminary Evaluation of a Tension Test for Concrete Repairs," Report Gr-83-14, Department of the Interior, Bureau of Reclamation.

8. ENVIRONMENTAL CONSIDERATIONS

Reasonable caution should guide the preparation, repair, and cleanup phases of activities involving potentially hazardous and toxic chemical substances. Manufacturer's recommendations to protect occupational health and environmental quality should be carefully followed. Material safety data sheets should be obtained from the manufacturers of such materials. In cases where the effects of a chemical substance on occupational health or environmental quality are unknown, chemical substances should be treated as potentially hazardous toxic materials.

9. AVAILABILITY AND COSTS

Ceilcote 665 Epoxy Mortar can be purchased from the manufacturer in units consisting of one 15 lb 4 oz-pail (6.9 kg) of liquid, one 6 lb 15 oz-can (3.1 kg) of Hardener No. 7 and one 100-lb bag (45.4 kg) of no. 1 sand to yield 1.08 cu ft. The cost is approximately \$170 plus shipping.