

Recommend Approval: <u><i>[Signature]</i></u> 9/27/12 Assistant Division Chief Date <u><i>[Signature]</i></u> 10/3/12 Division Chief Date	Maryland Department of Transportation State Highway Administration Office of Materials Technology MARYLAND STANDARD METHOD OF TESTS	
Approved: <u><i>[Signature]</i></u> 10-18-12 Director Date	COMPRESSIVE STRENGTH OF PURE EPOXY, EPOXY-SAND, AND POLYESTER- SAND CUBES	MSMT 501

SCOPE:

This procedure is used to determine the compressive strength of pure epoxy, epoxy-sand, and polyester sand mortars using 2 in. cube specimens.

REFERENCE DOCUMENTS:

T 106 - Compressive Strength of Hydraulic Cement Mortar

T 162 - Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

C 109 - Compressive Strength of Hydraulic Cement Mortars

C 778 - Specification for Standard Sand

MATERIALS AND EQUIPMENT:

1. Balance conforming to M 231, Class G2.
2. 400 and 1000 mL plastic tri-pour disposable beakers.
3. Plywood mixing sticks, 1 x 12 x 1/4 in. or spatula.
4. Specimen molds conforming to T 106.
5. Mixer, bowl, and paddle conforming to T 162.
6. Tamper and trowel conforming to T 106.
7. Testing machine conforming to T 106.
8. Standard sand, when required, shall conform to C 778.
9. Molding and curing room maintained at 68 to 81.5 F and at least 50 percent relative humidity.

TEST PROCEDURE:

1. Prepare the molds by cleaning all surfaces then apply a thin coat of commercial form release compound to the interior, exterior contact, and base plate surfaces. Assemble mold parts and secure to the base plate making sure all parts fit tightly. Seal outside of molds with paraffin.

Note: If epoxy grout comes packaged in a ready-to-use cartridge, go directly to Step 7.

2. Make three or more specimens for each period of test specified, i.e. 3, 7, and 28 days etc.
3. Determine manufacturer's mixing requirements and prepare as directed.
4. Measure an amount of each component of the epoxy into 1000 mL disposable plastic beakers in conformance with the manufacturer's mix ratio. Determine the amounts necessary before mixing. Six cubes require approximately 790 mL of material.

Note: Prepare approximately 850 mL of material for six cubes to accommodate molds and allow for excess.

5. If sand is required in the mix, measure the weight of the submitted or standard sand. Mix according to manufacturer's recommendations.

Note: The following shall be used as a referee mixing method in case of failure of the cubes using the hand mixing method.

Place each of the components into the mixer bowl, removing as much of the epoxy from the disposable beakers as possible, and mix for 60 seconds. Stop the mixer and scrape the sides of the bowl and paddle. Repeat twice, but mix for only 30 seconds each time. If mortar cubes are to be made, and a separate sand addition is necessary, add the sand after the third cycle and mix for 30 seconds. Scrape the sides of the bowl and paddle and mix for an additional 30 seconds.

6. Combine each component of the epoxy grout into a 1000 mL disposable plastic beaker and mix by hand using the mixing stick or spatula according to the manufacturer's instructions.

Note: Add sand, if required, and thoroughly mix in conformance with the manufacturer's instructions.

7. When thoroughly mixed, mold the specimens as specified in T 106, Step 10.4.4.
8. Allow the cubes to cure in the molds 24 hr. Remove from the molds and allow to further cure in the moisture room until time for testing.

9. Seven days after molding, carefully remove any loose grains, encrustations, or flashings from the cubes. Measure and record the length and width to the nearest 0.01 in. If an epoxy grout is being tested, refer to 902.11 (d).
10. Place each cube specimen in the test machine, centering it carefully below the upper bearing head.
11. Compress the specimen until failure. Record the maximum load. Repeat for the remaining specimens.

CALCULATIONS:

Calculate the compressive strength as follows:

$$S = \frac{P}{A}$$

where:

S = Compressive strength, psi,

P = Total load to failure, lb, and

A = Area of cube, in².

Note: If the cross sectional area of a specimen varies more than 0.06 in² from 4.00 in², the actual area shall be used for calculating the compressive strength.

Repeat the test if a specimen is faulty or compressive strength results differ more than 10 percent from the average.

REPORT:

Report the average compressive strength of the three cubes to the nearest 10 psi.