SECTION 1508

ELASTOMERIC CONCRETE

1508.1 DESCRIPTION

Elastomeric concrete is composed of a two-part rapid curing polymer binder material, aggregate and other ingredients as recommended by the binder manufacturer. Elastomeric concrete exhibits flexibility, suitable load carrying characteristics, ozone resistance, ultra-violet resistance and is not prone to cracking or spalling when exposed to ambient air temperatures of -30°F and warmer.

1508.2 REQUIREMENTS

Elastomeric concrete, when combined in the proportions and manner specified by the binder manufacturer, complies with the **TABLE 1508-1**:

TABLE 1508-1: ELASTOMERIC CONCRETE

Property	Requirements
Elastomeric binder after 7-day cure.	
Impact Strength @ -20°F	7 ft-lb, min.
Tensile Strength	500 psi, min.
Ultimate Elongation	100 %, min.
Tear Resistance	80 lb/in., min.
Elastomeric binder after 30-day oven aging.	
Impact Strength @ -29°C	7 ft-lb, min.
Tensile Strength	500 psi, min.
Ultimate Elongation	50 %, min.
Elastomeric binder-aggregate mixture after 7-day cure.	
Bond Strength to Concrete	300 psi, min
Wet Bond Strength to Concrete	225 psi, min
Compressive Stress at 5 % deflection	300 psi min, 2000 psi max.
Resilience	70 %, min.

d. Use aggregates that are compatible with the elastomeric binder, as supplied with the system, or as specified by the binder manufacturer.

1508.3 TEST METHODS

a. Preparation of Specimens.

Prepare specimens by thoroughly mixing the components in the ratios specified by the manufacturer. Before mixing, heat the components to the temperatures recommended by the manufacturer during placement in order to provide a workable mixture and give an initial cure representative of field placement. Apply no heat after mixing. If heating is not specified, mix the components at ambient temperature.

Because of the high bond strength of these materials, mold surfaces such as Teflon or lubricant-coated metal are recommended. Pour binder mixtures into molds as soon as possible after thorough mixing so they will flow well. Minimize entrained air during mixing. It may be removed by the use of vacuum, physical means, or passing a soft flame over the surface. Allow specimens cure sufficiently before removal from molds so that they will not be damaged by removal.

Cure specimens at either 73 ± 3ºF for 7 days or at 140 ± 4ºF for 30 days, and test as specified. Stamp specimens for tensile strength, ultimate elongation and tear resistance from cast sheets of the proper thickness as soon as the binder is sufficiently cured. Sand these specimens to remove irregularities and provide true surfaces.

b. Tests on the Elastomeric Binder.

(1) Impact Resistance. The specimen is a cast disk 2.50 ± 0.05 inches in diameter and 0.375 ± 0.010 inches thick. Sand the faces flat and parallel. After 7 days cure, condition the specimens for 4 hours at -20°F. Remove the specimen from the freezer and placed on a dry machined steel plate. Immediately after placing the disk on the plate, drop a 1 pound steel ball onto the center of the specimen through a guiding tube from an initial drop height of 5 feet. The drop height is increased by ½ foot intervals until the specimen cracks, or until all specimens exceed the specification minimums. The result will be the average of 4 specimens. Any cracking of a specimen will constitute failure. Repeat the procedure with 4 specimens that have been oven cured for 30 days.

(2) Tensile Strength. This test is performed according to ASTM D 638 using the Type IV specimen with dimension WO of 1 inch, which corresponds to Die C of ASTM D 412. Perform Testing after 7 days of cure. Measure the thickness and width of the specimen neck using a dial gauge or caliper, and determine the cross sectional area. Use an initial test machine jaw separation of 2 inches and a crosshead speed of 2 inches per minute. Load the specimen to failure. Use the maximum load to determine the tensile strength. Test at least 8 specimens. Discard those with obvious flaws. Repeat the procedure with 8 specimens that have been oven cured for 30 days.

(3) Ultimate Elongation. Perform this test as a part of Tensile Strength using the same specimens. Determine ultimate elongation from the initial jaw separation and the amount of crosshead travel at failure. Report results as a percent of the original gauge length. Repeat the procedure with 8 specimens that have been oven cured for 30 days.

(4) Tear Resistance. Determine tear resistance according to ASTM D 624 using the Die C specimen. Perform testing after 7 days cure. Determine the thickness of the specimen at the point of tear with a dial gauge prior to testing. Use an initial testing machine jaw separation of 2 inches, and a crosshead speed of 2 inches per minute. Test a minimum of 5 specimens.

c. Tests on the Elastomeric Binder-Aggregate Mixture.

(1) Bond Strength to Concrete. Cast the elastomeric concrete against a mortar briquette half (briquette complies to AASHTO T 132). Saw the briquette in half so that the sawed surface area equals approximately 1 sq in. Sandblast the surface. Place the briquette in the mold and cast the elastomeric concrete against the sawed surface. Cure the specimens 7 days in air at 73 ± 3°F. Using the Riehle briquette tester, specimen failure is considered to occur at either the bond interface or in either of the two materials. Test a minimum of 4 specimens. Determine an average tensile breaking stress based on a 1 sq in cross-sectional area.

(2) Wet Bond Strength to Concrete. Prepare mortar briquette halves the same as for Bond Strength to Concrete. After a 5-day cure in air at 73 ± 3°F, immerse the specimens in 73 ± 3°F water for 2 days in a horizontal position. After the immersion period, remove the specimens from the water and subject them to tensile testing with the Riehle briquette tester while still damp. Test a minimum of 4 specimens. Determine an average tensile breaking stress based on a 1 sq in cross-sectional area.

(3) Compressive Stress at 5 % Deflection. The test specimens are cast 1 inch cubes, prepared so as to have flat, parallel opposing faces free from irregularities. Cure the specimens seven days in air at 73 ± 3°F. Determine the original thickness of the specimen within 0.001 inch without a load. Place the specimen in the compression machine, apply a 100 pound load, and zero a dial gauge. Load the specimen at a rate of 0.15 inch per minute until a deflection of 0.10 inch is reached, at which point the compressive load is recorded and removed. Test a minimum of four cubes and calculate an average compressive stress based on the original 4 $in.^2$ area.

(4) Resilience. The Resilience test is a continuation of the Compressive Stress at 5 % Deflection test. After removal of the load, the specimen is allowed to recover for five minutes, after which the thickness is re-measured. Resilience is the percent recovery and is calculated as follows:

$$\text{Resilience} = \frac{(0.10 \text{ in.} + \text{final thickness} - \text{initial thickness}) \times (100)}{(0.10 \text{ in.})}$$

1508.4 PREQUALIFICATION

a. Manufacturers interested in prequalifying material under this specification must provide 3 sets of 2-component samples (2 for binder tests and 1 for binder-aggregate mixture tests) to the Engineer of Tests for laboratory testing. Provide 1 set of aggregate for binder-aggregate mixture testing. Include a copy of the quality control test report for the batch of material the sample represents, material safety data sheets, and a complete set of mixing and installation recommendations and instructions.

b. The material will be evaluated for compliance with this specification, and the manufacturer will be notified of the results. The Bureau of Construction and Materials will maintain a list of qualified materials. Products will remain on the prequalified list as long as the results of verification testing and field performance are satisfactory. Report any changes in formulation to the Engineer of Tests for review and evaluation to determine if re-qualification is necessary.

1508.5 BASIS OF ACCEPTANCE

a. Prequalification as required by **subsection 1508.4.**

b. Receipt and approval of a Type C certification as specified in **DIVISION 2600**.

c. Visual observation of performance in the field.