

7. A jig that will extend and hold the center of the tensile specimen from 1 in. to 2 in. (100% elongation of the center section).
8. Penetrometer with a grease cone attachment as described in ASTM D 217. Cone and moveable shaft together shall weigh 150 g.

D. SPECIMEN PREPARATION

Combine the volumes recommended by the manufacturer of the two-component sealant so that the total volume is a pint or less. Vigorously mix these materials for 45 seconds with an air powered stirrer fitted with a mixing blade. During the mixing, incorporate as little air as possible. Within 30 seconds after final mixing, pour the samples into the prepared molds described below. Do not scrape the sides of mixing vessel. More than one mixed batch may be required to prepare all specimens.

If the sealant comes in a side-by-side cartridge dispenser, use the static mixing nozzle provided by the manufacturer to prepare the samples below.

E. PROCEDURES

Part 1 MODULUS AT 150% Elongation

1. Clean the surface of the test blocks by rinsing under tap water while scrubbing gently. Dry the blocks thoroughly (minimum of 24 hours) before preparing the samples.
2. Prime the surfaces of the 1 in. × 2 in. × 3 in. concrete test blocks with primer furnished by the sealant manufacturer. Prepare six 1/2 in. × 1/2 in. × 2 in. specimens of sealant using Teflon spacers to create a mold cavity between each pair of test blocks. Use adhesive tape or rubber bands to hold each block assembly together. Seal the bottom opening of the mold cavity with adhesive tape. Pour the mixed sealant into each mold cavity taking care not to trap air bubbles. The 2-in. sides of the sealant shall be centered and parallel to the 2-in. side of the test block. Cure and condition the samples for 7 days at 25°C ± 2°C before testing. Remove the Teflon spacers, adhesive tape, etc. at the end of the first 24 hours.
3. At the end of 7 days, place the block assembly into the tensile testing apparatus. Extend the cast sealant specimen at the rate of 0.2 in./minute, to a width of 1 1/4 in. (150% extension).

4. Record the stress at 150% extension in pounds per square inch. The modulus is the average of two stress determinations.

Part 2 RECOVERY

1. After the modulus determination, insert the 1 1/4 in. spacers between the concrete blocks to maintain 150% extension. Condition the specimens for an additional 7 days at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$.
2. Remove the spacers and place the test specimens on a glass surface so that the two 1 in. \times 3 in. surfaces of each specimen bear directly on the glass. At 2-, 3-, and 5-minute intervals, lift the test specimen carefully to help relieve any friction that may restrict the recovery of the sealant.
3. Measure the width of the sealant (the distance between the 2-in. \times 3-in. interior face of the blocks) after 5 minutes of relaxation.

Part 3 NOTCH TEST

1. After the modulus determination, extend the test specimen to 1 1/4 in., insert the 1/4-in. spacers, and cut a notch 1/16 in. deep across the center of the 1/2 in. face of the sealant.
2. Examine the sealant 24 hours later for the extent of failure in cohesion or adhesion.

Part 4 WATER RESISTANCE

1. After the modulus determination, extend two specimens 100 % to 1 in. Insert the 1 in. spacers and immerse the specimens in de-ionized water at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 7 days.
2. Observe for tearing or loss of adhesion daily. Record the elapsed time when a tear or loss of bond exceeds 1/4 in.

Part 5 ULTRAVIOLET EXPOSURE TEST

1. Using a form, cast a smooth sheet of sealant 1/8 in. thick against a sheet of plastic. Cure the sample for 7 days at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Cut a tensile test specimen as described in California Test 434, Part 7 - 'Tensile Strength and Elongation.

2. Place the tensile test specimen in the jig and extend the center portion 100% and clamp the specimen so that it remains at 100% elongation.
3. Mount this jig in the accelerated weathering apparatus and test for 200 hours.
4. After 200 hours of exposure, the specimen shall exhibit no more than slight cracking or checking.

Part 6 CONE PENETRATION

1. Fill a 6 oz ointment container with the mixed sealant. Let cure 24 hours at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$.
2. Place the container with the mixed sealant on the penetrometer. Adjust the height of the penetrometer cone so that the tip just brushes the sealant's surface and zero the dial. Release the cone shaft for 5 seconds. Record penetration in millimeters (mm).
3. Make three tests for penetration on the surface of the mixed sample at points not less than 3/4 in. apart and 3/4 in. from the edge of the container. The cone penetration is the average of three determinations.

F. SAFETY AND HEALTH

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing and disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

<http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf>

End of Text
(California Test 435 contains 4 pages)