



WSDOT Test Method T 814

Method of Test for Water Retention Efficiency of Liquid Membrane-Forming Compounds and Impermeable Sheet Materials for Curing Concrete

1. SCOPE

This method is intended for laboratory use in determining the efficiency of liquid membrane-forming compounds, papers, and other impermeable sheet materials for curing concrete, as measured by their ability to prevent moisture loss during the early hardening period.

2. APPARATUS

- a. Molds — The molds shall be seamless tin ointment cans 3.4374 in. (87.31 mm) in diameter by 1.1874 in. (30.16 mm) deep.
- b. Mortar — Mortar for test specimens shall consist of a portland cement mixture of equal parts of Type II and Type III Portland cements, air entraining agent, sand and water, all well mixed in the proportions by mass of 1 part cement, 0.003 parts neutralized Vinsol resin (NVX), 2.2 parts sand, and 0.4 parts water, The portland cement shall conform to the *Standard Specifications for Portland cement*, ASTM Designation: C 150. The sand shall conform to the specifications for graded standard sand, ASTM Designation C 778.
 - (1) Mixing — Mixing shall preferably be done in a room in which the air temperature is $70^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($21^{\circ} \pm 2.8^{\circ}\text{C}$) and the relative humidity 40 to 60 percent. The temperature of the mortar at the time of molding shall be $70^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($21^{\circ} \pm 2.8^{\circ}\text{C}$). The cement and sand shall be mixed dry in a nonabsorptive vessel and the specified quantity of water, in which the Vinsol resin has been dissolved, shall be added. The mixture shall be allowed to absorb the water for a period of one minute. Testing shall be accomplished by WSDOT Test Method No. 307.
 - (2) Molding — The mold shall be filled with mortar and the mortar puddled with the gloved fingers only to the extent required for uniform and thorough consolidation. Excess mortar shall be removed and the surface smoothed with the gloved hands, immediately after which the surface shall be finished with one pass of a straightedge, using pressure and a sawing motion.
 - (3) Storage — Immediately after molding, the excess mortar on the outside of the molds shall be removed with a damp cloth. The molds containing the specimens shall be placed in a moist closet in an atmosphere maintained at $73.4^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$ ($23^{\circ} \pm 2^{\circ}\text{C}$) and relative humidity of not less than 95 percent.

3. PROCEDURE

- a. Application of Compound — Four hours after molding, the specimens shall be removed from the moist closet and the junction of specimen and mold sealed by means of a hot applied rosin/paraffin wax sealing material applied to the edges by means of a small brush or syringe, and shall not extend more than 3/16 in. (4.8 mm) onto the surface of the specimen.

A single coat of curing compound shall be applied to each specimen by the use of a brush. The compound shall be applied at the rate of 1.29 ml per test specimen. The proper mass of compound for the prescribed coverage shall be determined from the specific gravity of the material. This mass of compound (± 0.05 g) shall be measured by weighing the test specimens before and after application. When testing impermeable sheet materials, the sample is taped over the specimen with a pressure sensitive tape.

- b. Determination of Moisture Loss — One-half hour after application of the curing compound, each of the coated specimens shall be placed individually in 4-in. (101.6 mm) Scheibler desiccators. A 30 to 50 mm low form glass weighing bottle containing approximately 20 g of potassium hydroxide pellets accurately weighed to the nearest 5 mg, shall be placed on a wire screen supported about 1/4 in. (6.3 mm) above the surface of the mortar. The cover of the weighing bottle shall be removed and desiccator closed tightly with its cover. The desiccators shall be kept at a temperature of $70^{\circ}\text{F} \pm 2^{\circ}\text{F}$ ($21^{\circ} \pm 1^{\circ}\text{C}$) for 72 hours. At the conclusion of this period, the desiccator shall be opened, the cover shall be placed on the weighing bottle, and the mass (weight) determined to the nearest 5 mg. The increase in mass (weight) of the potassium hydroxide shall be taken as the loss of moisture from the specimen. The results of not less than three test specimens shall be averaged in computing the loss of moisture.

4. REPORTS

- a. Test results will be reported on Test Data Form WSDOT 350-034.