



Designation: D 3633 – 98

Standard Test Method for Electrical Resistivity of Membrane-Pavement Systems¹

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1. Scope

1.1 This test method covers the measurement of the electrical resistivity of water-barrier membrane-pavement systems when applied to concrete bridge decks.

1.2 Measurements shall be performed on the bituminous pavement surface covering the water-barrier membrane.

1.3 This test method utilizes a measure of electrical resistance between the saturated top surface of the water-barrier membrane and the reinforcing steel embedded in the concrete bridge deck.

1.4 The values measured represent the electrical resistance obtained with the equipment and procedures stated herein and do not necessarily agree or correlate with those using other equipment or procedures.

1.5 The values stated in SI units are to be regarded as the standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²

D 3743 Terminology Relating to Bridge Deck and Substructure Protection³

D 4071 Practice for Use of Portland Cement Concrete Bridge Deck Waterproof Barrier Membrane Systems³

E 105 Practice for Probability of Sampling Materials⁴

3. Terminology

3.1 For definitions of terms used in this specification, refer to Terminology D 3743.

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials, and is the direct responsibility of Subcommittee D04.32 on Bridges and Structures.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.03.

⁴ Annual Book of ASTM Standards, Vol 14.02.

4. Significance and Use

4.1 This test method for measuring the electrical resistivity of water-barrier membrane-pavement systems may be interpreted to indicate the effectiveness of such systems.

4.2 This test method is predicated on the fact that an electrical connection between the surface of the pavement and the reinforcing steel in the concrete pavement cannot be made through an impermeable water-barrier membrane.

4.3 This test method may be used for acceptance when the accepting agency specifies the minimum resistance value desired.

5. Apparatus

5.1 *Ohmmeter*, dc, 20 000 Ω/V rating connected to a double-pole, double-throw switch box or ac ohmmeter (switch box not required).

NOTE 1—When this test method is used for acceptance, the accepting agency should specify the type of ohmmeter to be used.

5.2 *Insulated Wire*, No. 18, Belden test probewire or equivalent. Two spools, minimum 38 m (125 ft).

5.3 *Copper Plate*, 305 by 305 by 3.0 mm (12 by 12 by $\frac{1}{8}$ in.), with the means for connecting the ohmmeter lead and a wooden handle approximately 1 m (39 in.) in length.

5.4 *Polyurethane Sponge*, 305 by 305 by 13 mm (12 by 12 by $\frac{1}{2}$ in.), to be attached to the copper plate with rubber bands or other suitable means. When assembled this apparatus is called the probe.

5.5 *Pressure Spray Can*, 12-L (3-gal) capacity, with a hose and spray nozzle.

6. Reagent

6.1 A wetting agent which, when added to the water, will break the surface tension and promote the penetration of the water through the bituminous pavement.

NOTE 2—An example of a wetting agent is a super-saturated solution of cupric sulfate crystals in warm water to which is added 19 mL/gal of Dioctyl Sodium Sulfo-succinate (Tradename “Aerosol” OT Clear, 10 %). When ambient test site temperature is below 50°F (10°C), add 15 % by volume of either isopropyl or denatured alcohol to prevent clouding of the wetting agent. Clouding of the wetting agent may inhibit penetration.