
Standard Method of Test for Coated Dowel Bars

AASHTO Designation: T 253M/T 253-24¹

Technically Revised: 2024

Technical Subcommittee: 4f, Metals



**American Association of State Highway and Transportation Officials
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1. SCOPE

- 1.1.
- These methods are designed to test the qualifications of the organic coating of corrosion-resistant dowel bars to withstand the effects of weathering, deicing chemicals, and the abrading and loading stresses experienced in field joints.
- 1.2.
- The values stated in either SI units or inch-pound units are to be regarded separately as standard. The inch-pound units are shown in parentheses. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.
- 1.3.
- The quality of the results produced by this standard is dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1.
- AASHTO Standards:
 - M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - R 39M/R 39, Making and Curing Concrete Test Specimens in the Laboratory
 - T 106M/T 106, Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)
- 2.2.
- ASTM Standards:
 - D1474/D1474M, Standard Test Methods for Indentation Hardness of Organic Coatings
 - E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
 - E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
 - E1137/E1197M, Standard Specification for Industrial Platinum Resistance Thermometers
 - G8, Standard Test Methods for Cathodic Disbonding of Pipeline Coatings
 - G12, Standard Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel (withdrawn 2013; replaced by D7091)

- G14, Standard Test Method for Impact Resistance of Pipeline Coatings (Falling Weight Test)
- G20, Standard Test Method for Chemical Resistance of Pipeline Coatings

2.3. *Other Standard:*

- IEC 60751: 2008, Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. MATERIALS AND APPARATUS

- 3.1. The concrete design and constituents shall comply with the procedure and specification stated by the purchasing or specifying agency.
- 3.2. Suitable containers, molds, and miscellaneous concrete mixing equipment necessary for mixing and casting the simulated doweled joints for load, pullout, and corrosion tests to meet condition stated in R 39.
- 3.3. An abradometer capable of operating at 60 to 70 double strokes per minute using 100-mm- (4-in.) long strokes.
- 3.4. Universal test machine capable of operating accurately in the 0- to 45-kN (10,000 lbf) ranges and capable of controlled stress and strain rate loading.
- 3.5. Suitable hold-down devices for positioning and holding the casting in place without rotation during the flexure tests.
- 3.6. Freeze-thaw equipment of sufficient capacity to handle the pullout and corrosion-abrasion test specimens. The freeze-thaw equipment shall be capable of operation at the temperatures required, at least between -28.9 to 22.8°C (-20 to 73°F), within $\pm 1.7^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$), as corrected, if necessary, by standardization. The freeze-thaw unit thermometer for measuring the temperature of materials shall meet the requirements of M339M/M 339 with a temperature range of at least -35 to 30°C (-31 to 86°F), and an accuracy of $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) (see Note 1).
- Note 1**—Thermometer types suitable for use include: ASTM E1 Mercury thermometers; ASTM E879 Thermistor thermometer; ASTM E1137 Pt-100 RTD Platinum Resistance Thermometer, Class A; or IEC 60751: 2008 2008 Pt-100 RTD Platinum Resistance Thermometer, Class AA.
- 3.7. Sufficient quantities of chemical to maintain solution for corrosion tests.
- 3.8. Thermometer for measuring temperature of an environmental chamber or controlled room environment shall meet the requirements of M 339M/M 339 with a temperature range of at least 19 to 27°C (66.2 to 80.6°F) and an accuracy of $\pm 1.7^{\circ}\text{C}$ ($\pm 3^{\circ}\text{F}$) (see Note 2).
- Note 2**—Thermometer types suitable for use include: ASTM E1 Mercury thermometers; ASTM E879 Thermistor thermometer; ASTM E1137 Pt-100 RTD Platinum Resistance Thermometer, Class A; or IEC 60751: 2008 2008 Pt-100 RTD Platinum Resistance Thermometer, Class AA.

4. PREPARATION OF SAMPLES

- 4.1. The coated dowels for deflection tests may be in support baskets or loose. The coated dowels for the remainder of tests shall be loose.
- 4.2. Type A-coated dowels shall be cast without additional coating of any kind. Type B-coated dowels shall be covered before casting with the debonding agent specified by the coating manufacturer.