
Standard Method of Test for Bulk Specific Gravity (G_{mb}) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens

AASHTO Designation: T 166-24

Technically Revised: 2024

Editorially Revised: 2024

Technical Subcommittee: 2c, Asphalt–Aggregate Mixtures



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1. SCOPE

- 1.1. This method of test covers the determination of bulk specific gravity (G_{mb}) of specimens of compacted asphalt mixtures.
- 1.2. This method should not be used with specimens that contain open or interconnecting voids or absorb more than 2.0 percent of water by volume. If the specimen contains open or interconnecting voids or absorbs more than 2.0 percent of water by volume, then T 275 or T 331 should be used.
- 1.3. The bulk specific gravity (G_{mb}) of the compacted asphalt mixture may be used in calculating the unit mass of the mixture.
Note 1—The values for bulk specific gravity (G_{mb}) obtained from T 275 or T 331 may differ. Care should be exercised when comparing test results from T 275 and T 331.
- 1.4. The values stated in SI units are to be regarded as the standard.
- 1.5. *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all 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.*
- 1.6. *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 231, Weighing Devices Used in the Testing of Materials
 - 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 79, Vacuum Drying Compacted Asphalt Specimens
- T 275, Bulk Specific Gravity (G_{mb}) of Compacted Asphalt Mixtures Using Paraffin-Coated Specimens
- T 329, Moisture Content of Asphalt Mixtures by Oven Method
- T 331, Bulk Specific Gravity (G_{mb}) and Density of Compacted Asphalt Mixtures Using Automatic Vacuum Sealing Method

2.2. *ASTM Standards:*

- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
- D8055, Standard Guide for Selecting an Appropriate Electronic Thermometer for Replacing Mercury Thermometers in D04 Road and Paving Standards
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers
- E2877, Standard Guide for Digital Contact Thermometers

2.3. *International Electrotechnical Commission Standards:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
- IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. **TERMINOLOGY**

3.1. *Definitions:*

- 3.1.1. *bulk specific gravity (of solids) (G_{mb})*—The ratio of the mass in air of a unit volume of a permeable material (including both permeable and impermeable voids normal to the material) at a stated temperature to the mass in air of equal density of an equal volume of gas-free distilled water at a stated temperature.
- 3.1.1.1. *Discussion*—Although the classic definition of bulk specific gravity involves a ratio of the mass of a given test specimen volume to the same mass of the volume of gas-free distilled water, Method A of this test method uses water that is not gas-free and distilled for practical purposes. Method B requires distilled water that is not gas-free because gases are readily introduced during testing. The precision and bias statements have been developed using water with undefined characteristics.
- 3.1.2. *constant mass*—Shall be defined as the mass at which further drying does not alter the mass by more than 0.05 percent when weighed at 2-h intervals when using oven drying, or by more than 0.05 percent when weighed after at least two drying cycles of the vacuum-drying apparatus required in R 79.
- 3.1.3. *potable water*—Water that is suitable for drinking.