
Standard Method of Test for

Bulk Specific Gravity and Density of Compacted Asphalt Mixtures Using Automatic Vacuum Sealing Method

AASHTO Designation: TP 69-04¹

ASTM Designation: D 6752-02a



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

- 1.1. This method covers the determination of bulk specific gravity of specimens of compacted asphalt mixtures as defined in E 1547.
- 1.2. This method should be used with samples that contain open or interconnecting voids and/or absorb more than 2 percent of water by volume, as determined by T 166. An agency may specify this method as an alternative to T 275.
- 1.3. The bulk specific gravity of the compacted asphalt mixtures may be used in calculating the unit mass of the mixture.
- 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 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. *AASHTO Standards:*
 - M 231, Weighing Devices Used in the Testing of Materials
 - T 166, Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens
 - T 209, Theoretical Maximum Specific Gravity and Density of Hot-Mix Asphalt Paving Mixtures
 - T 275, Bulk Specific Gravity of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
- 2.2. *ASTM Standards:*
 - C 670, Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials
 - D 8, Standard Terminology Relating to Materials for Roads and Pavements

- D 3549, Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens
- D 4460, Practice for Calculating Precision Limits Where Values are Calculated from Other Test Methods
- E 29, Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E 1547, Standard Terminology Relating to Industrial and Specialty Chemicals

3. TEST SPECIMENS

- 3.1. Test specimens may be either laboratory-molded asphalt mixtures or from asphalt pavements. The mixtures may be surface or wearing course, binder or leveling course, or hot-mix base.
- 3.2. *Size of Specimens*—It is recommended (1) that the diameter of cylindrically molded or cored specimens, or the length of the sides of sawed specimens, be at least equal to four times the maximum size of the aggregate; and (2) that the thickness of specimens be at least one and one-half times the maximum size of the aggregate.
- 3.3. Pavement specimens shall be taken from pavements with a core drill, diamond or carborundum saw, or by other suitable means.
- 3.4. Care shall be taken to avoid distortion, bending, or cracking of specimens during and after the removal from the pavement or mold. Specimens shall be stored in a safe, cool place.
- 3.5. Specimens shall be free from foreign materials such as seal coat, tack coat, foundation material, soil, paper, or foil.
- 3.6. If desired, specimens may be separated from other pavement layers by sawing or other suitable means. Jagged edges or sharp aggregates may puncture the plastic bag. Specimen ends or planar edges may require sawing if the bag does not conform to the specimen in a uniform manner.

4. APPARATUS

- 4.1. *Bag Cutter*—A knife, scissors, or other types of clipping devices may be used to quickly open bags.
- 4.2. *Balance*—The balance shall have sufficient capacity, be readable to 0.1 percent of the sample mass or better, and conform to the requirements of M 231. The balance shall be equipped with a suitable suspension apparatus and holder to permit weighing the specimen while suspended from the center of the scale pan of the balance.
- 4.3. *Plastic Bags*—The two most commonly used sizes of bags are designated as small and large size bags. The small bags shall have a minimum opening of 235 mm (9.25 in.) and a maximum opening of 260 mm (10.25 in.) with a mass of less than 35 g. The large bags shall have a minimum opening of 375 mm (14.75 in.) and a maximum opening of 394 mm (15.5 in.) with a mass of 35 g or more. The bags shall be made of a plastic material that will not adhere to asphalt film, puncture resistant, capable of withstanding sample temperatures of up to 70°C (158°F), impermeable to water, and contain no air channels for evacuation of air from the bag. The bags shall have a minimum thickness of 0.100 mm (0.004 in.) and a maximum thickness of 0.152 mm (0.006 in.). The manufacturer shall provide the apparent specific gravity or a regression formula for the