



Designation: D 6752 – 02

Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method¹

This standard is issued under the fixed designation D 6752; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of maximum specific gravity of loose bituminous mixtures by the vacuum sealing method.

1.2 This method can be used for compacted cylindrical and cubical bituminous laboratory and field specimens.

1.3 The bulk specific gravity of the compacted bituminous mixtures may be used in calculating the unit weight of the mixture.

1.4 *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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 979 Practice for Sampling Bituminous Paving Mixtures²

D 1461 Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures²

D 2726 Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures²

D 3203 Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures²

D 4753 Specification for Evaluating, Selecting and Specifying Balances and Scales for Use in Soil, Rock, and Construction Materials Testing³

3. Significance and Use

3.1 The results obtained from this method can be used to determine the unit weight of compacted bituminous mixtures and in conjunction with Test Method D 3203, to obtain percent air voids. These values in turn may be used in determining the relative degree of compaction.

3.2 Since specific gravity has no units, it must be converted to density in order to do calculations that require units. This

conversion is made by multiplying the specific gravity at a given temperature by the density of water at the same temperature.

3.3 This method can be used for 100 mm and 150 mm diameter cylindrical as well as cubical asphalt specimens to correct for absorptive and open graded mixes. Mixes such as Stone Matrix Asphalt (SMA), porous friction coarse, and Superpave coarse graded mixes with significant surface texture and interconnected voids should be sealed for accurate bulk specific density results. Follow manufacturer recommendation for appropriate bag sizes to be utilized with cubical and abnormally shaped samples.⁴

4. Apparatus

4.1 *Balance*, with ample capacity, and with sufficient sensitivity to enable bulk specific gravity of specimens to be calculated to at least four significant figures, that is to at least three decimal places. It shall be equipped with a suitable apparatus to permit weighing the specimen while it is suspended in water. The balance shall conform to Specification D 4753 as a class GP2 balance.

NOTE 1—Since there are no more significant figures in the quotient (bulk specific gravity) than appear in either the dividend (the mass of the specimen in air) or in the divisor (the volume of the specimen, obtained from the difference in mass of the specimen in air and in water), this means that the balance must have a sensitivity capable of providing both mass and volume values to at least four figures. For example, a sensitivity of 0.1 g would provide four significant figures for the determination of a mass in the range from 130.0 to 999.9 g when the specific gravity is 2.300.

4.2 *Water Bath*, with minimum dimensions (Length $\times$ Width $\times$ Depth) of 610 $\times$ 460 $\times$ 460 mm (24 $\times$ 18 $\times$ 18 in.) or a large cylindrical container, for completely submerging the specimen in water while suspended, equipped with an overflow outlet for maintaining a constant water level.

NOTE 2—It is preferable to keep the water temperature constant by using a temperature controlled heater. Also, to reduce the chance for the

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.21 on Specific Gravity and Density of Bituminous Mixtures.

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² *Annual Book of ASTM Standards*, Vol 04.03.

³ *Annual Book of ASTM Standards*, Vol 04.08.

⁴ Bulk specific gravity determined by this method may be lower than the results obtained by Test Method D 2726. As a result, air voids determined from these bulk specific gravity values may be higher than the air voids values determined using Test Method D 2726. These differences may be more pronounced for coarse aggregate mixtures. Users of this method are cautioned to evaluate any alteration in percent asphalt content or aggregate gradations for mix designs with a known positive performance history.