



Designation: D 1188 – 96^{€1}

Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples¹

This standard is issued under the fixed designation D 1188; 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 (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—The title of this standard was corrected editorially in April 1998.

1. Scope

1.1 This test method covers the determination of bulk specific gravity of specimens of Parafilm-coated, compacted bituminous mixtures as defined in Terminology E 12.

1.2 This method should be used with samples that contain open or interconnecting voids or absorb more than 2 % of water by volume, or both, as determined by Section 8.

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 limitations 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 Testing Soil, Rock, and Related Construction Materials³

E 12 Terminology Relating to Density and Specific Gravity of Solids, Liquids, and Gases⁴

3. Significance and Use

3.1 This test method is useful in calculating percent air voids as given in Test Method D 3203. Since specific gravity

has no units, it must be converted to density when this type of measurement is required. This conversion is made by multiplying the specific gravity at a given temperature by the density of water at the same temperature.

4. Apparatus

4.1 *Balance*, with ample capacity, and with sufficient sensitivity to enable bulk specific gravities to the 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.

4.1.1 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*, for immersing the specimen in water while suspended, equipped with either an overflow outlet for maintaining a constant water level or an electronic tare feature on the scale.

5. Materials

5.1 *Parafilm*—Is an elastomeric film obtainable from most scientific suppliers.

5.2 *Polyurethane Foam*—A foam mat of a minimum of 50 × 50 cm (20 × 20 in.) shall be used for the working surface by about 12.5 mm (0.5 in.) thick. Additionally, a minimum of one foam pad with a size approximately equal to the top surface dimensions of the sample shall be on hand.

5.3 *Calibration Cylinder*—An approximately 100-mm (4-in.) diameter by 60-mm (2.5-in.) smooth-sided aluminum cylinder.

6. Test Specimens

6.1 Test specimens may be molded from laboratory-mixed

¹ This test method is under the jurisdiction of ASTM Committee D-4 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 Annual Book of ASTM Standards, Vol 15.05.