



Designation: D6857/D6857M – 23

Standard Test Method for Maximum Specific Gravity and Density of Asphalt Mixtures Using Automatic Vacuum Sealing Method¹

This standard is issued under the fixed designation D6857/D6857M; 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 and density of uncompacted asphalt mixtures at 25 °C [77 °F].

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. 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 text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D979/D979M Practice for Sampling Asphalt Mixtures
D2041/D2041M Test Method for Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures

D3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing
E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method
E1547 Terminology Relating to Industrial and Specialty Chemicals

3. Terminology

3.1 The terms ‘specific gravity’ and ‘density’ used in this test method are in accordance with the Terminology **E1547**.

3.2 Definitions:

3.2.1 *density*—as determined by this test method, the mass of a cubic meter of the material at 25 °C in SI units, or the mass of a cubic foot of the material at 77 °F in inch-pound units.

3.2.2 *residual pressure*—as employed by this test method, the pressure in a vacuum chamber when vacuum is applied.

3.2.3 *specific gravity*—as determined by this test method, the ratio of a given mass of material at 25 °C [77 °F] to the mass of an equal volume of water at the same temperature.

4. Summary of Test Method

4.1 A weighed sample of oven-dried asphalt mixture in the loose condition at room temperature is placed inside a specially designed channel bag. The bag containing the sample is placed inside another bag and placed inside a vacuum chamber. Air is evacuated from the sample to an absolute pressure of 6.0 mm Hg [6 Torr] and is automatically sealed. The bags containing the sample are removed from the vacuum chamber and placed inside a large water tank equipped with scales for weighing the sample underwater. While completely submerged, the bag is cut open by scissors to allow the water to enter the bag. Since the sample is under complete vacuum, water will be forced around all the accessible areas of the sample. The difference in weight in air and suspended weight in water will provide the sample volume after correcting for the bag influence. The dry weight and the volume can be used to calculate the maximum specific gravity of the sample. This method is a rapid technique for determination of maximum specific gravity that minimizes

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 Asphalt Mixtures.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.