



Designation: D6995 – 21

Standard Test Method for Determining Field VMA Based on the Maximum Specific Gravity of an Asphalt Mixture (G_{mm})¹

This standard is issued under the fixed designation D6995; 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 is intended to be used for a rapid field determination of voids in mineral aggregate (VMA) of asphalt mixture. It provides equations for calculating the VMA based on the asphalt content of the mix and its maximum specific gravity (G_{mm}). It is intended that this should be used for the rapid “field” determination of VMA during quality control (QC) operations at HMA plants, particularly where the specific gravity of the aggregate is highly variable.

NOTE 1—VMA determined using the rapid field method is VMA that has been corrected for aggregate absorption.

1.2 *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.*

1.3 *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

[D127 Test Method for Relative Density \(Specific Gravity\) and Absorption of Coarse Aggregate](#)

[D128 Test Method for Relative Density \(Specific Gravity\) and Absorption of Fine Aggregate](#)

[D70/D70M Test Method for Specific Gravity and Density of Semi-Solid Asphalt Binder \(Pycnometer Method\)](#)

[D854 Test Methods for Specific Gravity of Soil Solids by Water Pycnometer](#)

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.

[D2041/D2041M Test Method for Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures](#)

[D2172/D2172M Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures](#)

[D2726/D2726M Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures](#)

[D6307 Test Method for Asphalt Content of Asphalt Mixture by Ignition Method](#)

[D6857/D6857M Test Method for Maximum Specific Gravity and Density of Asphalt Mixtures Using Automatic Vacuum Sealing Method](#)

3. Summary of Test Method

3.1 The percent of (field) VMA in the mix can be calculated by means of equations in which measured values for the theoretical maximum specific gravity, the asphalt content, the specific gravity of the asphalt, and the average bulk specific gravity of the total aggregate and the compacted mix are known.

4. Significance and Use

4.1 Various users desire indication of compliance with VMA specifications for hot mix asphalt (HMA) during production.

4.2 The standard practice for determining VMA requires that the bulk specific gravity of the aggregate components be determined. This is a very time-consuming test, which is not suitable for routine QC procedures.

4.3 When an aggregate source used in the mix has a highly variable bulk specific gravity and a reference average bulk specific gravity (G_{sb}) (for example, as established in the mix design) is used to calculate VMA during HMA production, erroneous values may occur.

4.4 The test for maximum specific gravity of the mix (G_{mm}) is a routine QC test at HMA plants. The effective specific gravity of the aggregate components (G_{se}) can be easily calculated from this test. However the G_{se} does not take into account the amount of asphalt absorbed, which is required for accurate VMA determination. This method provides a means to correct the G_{se} to account for the average absorbed asphalt. This procedure should not be used if the percent water