



Standard Test Method for Determining the Permanent Shear Strain and Complex Shear Modulus of Asphalt Mixtures Using the Superpave Shear Tester (SST)¹

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1. Scope

1.1 This standard provides performance-related test procedures for the determination of stiffness complex shear modulus and permanent shear strain of asphalt mixtures using the Superpave Shear Tester (SST). This standard is applicable to the testing and analysis of modified and unmodified asphalt mixtures.

1.2 This standard is applicable to specimens prepared in a laboratory or cored from a pavement for post-construction analysis. It is intended for use with specimens having the following minimum dimensions:

Nominal Maximum Aggregate Size in Asphalt Mixture	Specimen Diameter	Specimen Height
19 mm	150 mm	50 mm
12.5 mm, 9.5 mm, 4.75 mm	150 mm	38 mm

NOTE 1—Nominal maximum aggregate size is defined in AASHTO R35 as one sieve larger than the first sieve to retain more than 10 % of the total aggregate. Asphalt mixtures with a nominal maximum aggregate size greater than 19 mm can be tested using this procedure, but it is not recommended. The larger aggregate sizes may significantly interfere with the material response, thereby affecting the repeatability of the test.

NOTE 2—The SST shall accommodate test specimens of 150 mm in diameter and 50 mm in height. The specimen height of 50 mm is preferred, but may not be available in roadway cores where layer thickness may be less. If the specimen height is less than 50 mm, use platen to platen fixturing (Linear Variable Differential Transformers (LVDTs) or extensometers). Specimen heights less than 38 mm cannot be tested because of equipment constraints.

NOTE 3—The diameter-to-height ratio for shear test specimens should be 3:1 or greater. This effectively eliminates the use of 100 mm diameter specimens (because of minimum height requirement for testing discussed in Note 2).

1.3 The between laboratory reproducibility of this test method has not been determined, therefore this standard should not be used for acceptance or rejection of a material for purchasing purposes.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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:²

- D75 Practice for Sampling Aggregates
- D140 Practice for Sampling Bituminous Materials
- D979 Practice for Sampling Bituminous Paving Mixtures
- D2041 Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- D2726 Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
- D3203 Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
- D3549 Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens
- D5361 Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing
- D6752 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
- D6857 Test Method for Maximum Specific Gravity and Density of Bituminous Paving Mixtures Using Automatic Vacuum Sealing Method
- D6925 Test Method for Preparation and Determination of the Relative Density of Asphalt Mix Specimens by Means of the Superpave Gyratory Compactor
- E1 Specification for ASTM Liquid-in-Glass Thermometers
- E4 Practices for Force Verification of Testing Machines

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.26 on Fundamental/Mechanistic Tests.

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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.