



Designation: D8667 – 26

Standard Test Method for Determining Intermediate and Low-Temperature Rheological Properties of Asphalt Binders Using a Dynamic Shear Rheometer (DSR)¹

This standard is issued under the fixed designation D8667; 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 parameters calculated from the measurement of modulus (G^*) and phase angle (δ) of asphalt binders when tested in dynamic (oscillatory) shear using parallel plate geometry in accordance with Test Method [D7175](#). These parameters are considered important to the design of roofing binders, but will also be applicable to other paving and industrial applications that require a greater knowledge of rheological parameters relating to performance.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 A precision and bias statement for this test method has not been completed at this time. Therefore, this test method should not be used for acceptance or rejection of a material for purchasing purposes.

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

[D8 Terminology Relating to Materials for Roads and Pavements](#)

¹ This test method is under the jurisdiction of ASTM Committee [D04](#) on Road and Paving Materials and is the direct responsibility of Subcommittee [D04.44](#) on Rheological Tests.

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

[D6373 Specification for Performance-Graded Asphalt Binder](#)

[D7175 Test Method for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer](#)

[D7643 Practice for Determining the Continuous Grading Temperatures and Continuous Grades for PG Graded Asphalt Binders](#)

3. Terminology

3.1 Definitions of terms used in this test method may be found in Terminology [D8](#), Test Method [D7175](#), determined from common English usage, or combinations thereof.

4. Summary of Test Method

4.1 This standard includes the procedure to obtain complex shear modulus (G^*) and phase angle (δ) of asphalt binders using the dynamic shear rheometer (DSR) with parallel plate geometry.

4.2 Test specimens, nominally 8 mm in diameter by 2 mm thick, are formed between parallel metal plates.

4.3 During testing, one of the parallel plates is oscillated with respect to the other at a preselected frequency and shear strain. The designated shear strain is such that the testing is expected to be within the linear viscoelastic region of the asphalt binder.

4.4 The procedure uses a multi-point measurement to determine G^* and δ at multiple temperatures (T) and a fixed frequency (ω).

4.4.1 The values of T , G^* and δ from multi-point measurements can be used to interpolate various rheological parameters or make single-point determinations, such as those shown in [Table 1](#).

4.4.2 Rheological parameters are designated in the form R_s , and can be calculated at a specified critical value, X_s . R_s can be determined by obtaining two measurements of the dependent rheological property, Y , and the independent rheological property, X , when tested per [Section 12](#). Interpolation is performed using a form equation similar to Equation 3 in 6.2.3 of Practice [D7643](#).