



Standard Test Method for Solubility of Asphalt Binders in Toluene by Centrifuge¹

This standard is issued under the fixed designation D5546; 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 determination of the degree of solubility of asphalt binders in toluene using centrifugal separation. The method is an alternative to Test Method [D2042](#), and may be preferable to Test Method [D2042](#) when testing modified asphalt binders.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 A complete precision statement for this standard has not been developed at this time. Therefore, this standard should not be used for acceptance or rejection of a material for purchasing purposes.

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

[D36](#) Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)

[D2042](#) Test Method for Solubility of Asphalt Materials in Trichloroethylene

[D3666](#) Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

[D4007](#) Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure)

¹ This test method is under the jurisdiction of ASTM Committee [D04](#) on Road and Paving Materials and is the direct responsibility of Subcommittee [D04.47](#) on Miscellaneous Asphalt Tests.

Current edition approved June 1, 2009. Published June 2009. Originally approved in 1994. Last previous edition approved in 2001 as D5546 – 01. DOI: 10.1520/D5546-09.

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.

3. Summary of Test Method

3.1 The sample is dissolved in toluene and centrifuged to separate the insoluble material. The insoluble material is dried and weighed.

4. Significance and Use

4.1 This test method is a measure of the solubility of polymer-modified asphalt in toluene. The portion that is soluble in toluene represents the active cementing constituents. Additional tests to characterize the insoluble residue may be conducted. Such tests might include infrared spectroscopy, microscopy, ash content, and so forth.

NOTE 1—The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of Specification [D3666](#) are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with Specification [D3666](#) alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of Specification [D3666](#) or some similar acceptable guideline provides a means of evaluating and controlling some of these factors.

5. Apparatus and Materials

5.1 Centrifuge:

5.1.1 A centrifuge with a swinging bucket rotor capable of spinning two or more filled centrifuge tubes shall be used. The centrifuge shall be capable of delivering a minimum relative centrifugal force (RCF) of 700 at the tip of the tubes, and maintaining this RCF for a minimum of 10 min.

5.1.2 The revolving head, trunnion rings, and trunnion cups, including the cushions, shall be constructed soundly to withstand the maximum centrifugal force capable of being delivered by the power source. The trunnion cups and cushions shall support the tubes firmly when the centrifuge is in motion. The centrifuge shall be enclosed by a metal chamber strong enough to eliminate danger if any breakage occurs. The centrifuge chamber shall be isolated from potential ignition sources.

5.2 *Centrifuge Tubes*—For referee testing, each centrifuge tube shall be a 100-mL cone-shaped tube conforming to the dimensions given in [Fig. 1](#). For routine quality assurance testing, alternate centrifuge tubes may be used. Alternate centrifuge tubes shall have a cone shaped bottom, a length between 150-210 mm, and a nominal capacity of 100 mL. All