



Designation: ~~D2042-01~~ Designation: D 2042 – 09

Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene¹

This standard is issued under the fixed designation D 2042; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the determination of the degree of solubility in trichloroethylene of asphalt materials having little or no mineral matter.

~~NOTE 1—Use of carbon disulfide, carbon tetrachloride, and benzene has been discontinued in this method because of the safety hazards involved. This method is not applicable to tars and their distillation residues or highly cracked petroleum products. For methods covering tars, pitches, and other highly cracked petroleum products, and the use of other solvents, see Test Methods D 4, D 2318, and D 2764. 1—This method is not applicable to tars and their distillation residues or highly cracked petroleum products. For methods covering tars, pitches, and other highly cracked petroleum products, and the use of other solvents, see Test Methods D 4, D 2318, and D 2764.~~

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~~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 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. Specific precaution statements are given in Section 7.~~

2. Referenced Documents

2.1 *ASTM Standards:*²

C 670 [Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials](#)

D 4 [Test Method for Bitumen Content](#)

D 2318 [Test Method for Quinoline-Insoluble \(QI\) Content of Tar and Pitch](#)

D 2764 [Test Method for Dimethylformamide-Insoluble \(DMF-I\) Content of Tar and Pitch](#)

~~E177 Practice for the Use of the Terms Precision and Bias in ASTM Test Methods~~ [Test Method for Dimethylformamide-Insoluble \(DMF-I\) Content of Tar and Pitch](#)

D 3666 [Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials](#)

2.2 *AASHTO Standard:*³

T44 [Solubility of Bituminous Materials in Organic Solvents](#)

3. Summary of Method

3.1 The sample is dissolved in trichloroethylene and filtered through a glass fiber pad. The insoluble material is washed, dried, and weighed.

4. Significance and Use

4.1 This test method is a measure of the solubility of asphalt in trichloroethylene. The portion that is soluble in trichloroethylene represents the active cementing constituents.

~~NOTE 2—The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the~~

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 Dec. 10, 2001. Published March 2002. Originally published as D2042-66. Last previous edition D2042-97.~~

Current edition approved June 1, 2009. Published June 2009. Originally approved in 1966. Last previous edition approved in 2001 as D 2042 – 01.

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*, Vol 04.04, volume information, refer to the standard's Document Summary page on the ASTM website.

³ Annual Book of ASTM Standards, Vol 05.01.

³ Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.

capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of Specification D 3666 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with Specification D 3666 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of Specification D 3666 or some similar acceptable guideline provides a means of evaluating and controlling some of these factors.

5. Apparatus and Materials

5.1 The assembly of the filtering apparatus is illustrated in Fig. 1. Details of the component parts are as follows:

5.1.1 *Bitumen Crucible or Gooch Crucible*, glazed inside and outside with the exception of outside bottom surface. The approximate dimensions shall be a diameter of 44 mm at the top, tapering to 36 mm at the bottom, and a depth of 24–28–20–30 mm.

5.1.2 *Glass Fiber Pad, 3.2-cm. Glass Microfiber Filter Pad*, 32–34 mm diameter, fine porosity, fast flow rate, 1.5 μm particle retention.

5.1.3 *Filter Flask*, heavy-wall, with side tube, 250- or 500-mL capacity.

5.1.4 *Filter Tube*, 40- to 42-mm inside diameter.

5.1.5 *Rubber Tubing or Adapter*, for holding the Gooch crucible on the filter tube.

NOTE 2—Other suitable assemblies permitting vacuum filtration with a Gooch crucible may be used.

5.1.6 *Erlenmeyer Flask*, 125 mL.

5.1.7 *Oven*, capable of maintaining a temperature of $110 \pm 5^\circ\text{C}$.

6. Reagent

6.1 *Trichloroethylene*, technical grade.

7. Safety Precautions

7.1 Trichloroethylene is toxic, and good ventilation should be provided. It is more flammable than carbon tetrachloride.

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8. Preparation of Gooch Crucible

8.1 Place the Gooch crucible plus one thickness of the glass fiber filter pad in an oven at $110 \pm 5^\circ\text{C}$ for 15 min, allow to cool in a desiccator for 30 ± 5 min, and then determine the mass to the nearest 0.1 mg. Designate this mass as A. Store in the desiccator until ready for use.

9. Sample Preparation

9.1 If the sample is not fluid, heat to any convenient temperature, but in any case not more than 100°C above the softening point. Normally the temperature at which this test is run is not critical, and it may be performed at the laboratory air temperature.

For referee tests, however, the flask and sample in solution shall be placed in a water bath maintained at $37.8 \pm 0.3^\circ\text{C}$ for 1 h before filtering.

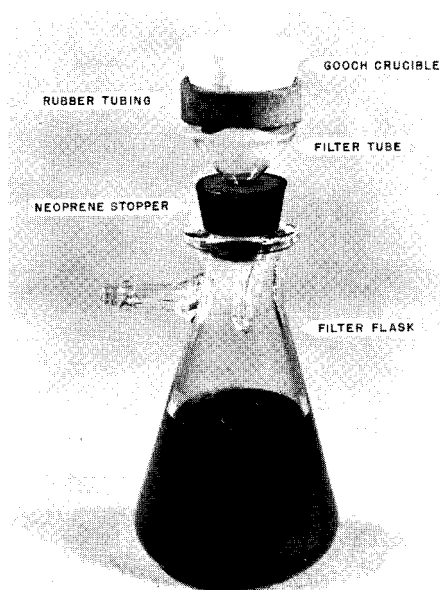


FIG. 1 Filtering Apparatus Assembly