



Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene¹

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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 2317, D 2318, and D 2764.

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 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:

- D 4 Test Method for Bitumen Content²
- D 2317 Test Method for Benzene Insoluble (BI) Content of Tar and Pitch³
- D 2318 Test Method for Quinoline-Insoluble (QI) Content of Tar and Pitch²
- D 2764 Test Method for Dimethylformamide-Insoluble (DMF-I) Content of Tar and Pitch²
- E 177 Practice for the Use of the Terms Precision and Bias in ASTM Test Methods⁴

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.

¹ This test method is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.47 on Miscellaneous Asphalt Tests.

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² *Annual Book of ASTM Standards*, Vol 04.04.

³ Discontinued—See *1981 Annual Book of ASTM Standards*, Part 15.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

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 *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 28 mm.

5.1.2 *Glass Fiber Pad*, 3.2-cm.⁵

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.

8. Preparation of Gooch Crucible

8.1 Place the Gooch crucible plus one thickness of the glass fiber pad in an oven at $110 \pm 5^\circ\text{C}$ for 15 min, allow to cool in a desiccator, 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 111°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.

⁵ Whatman Grade 934 AH glass microfiber filter pad, available from Reeves Angel and Co., Clifton, NJ, has been found suitable.