



Standard Test Method for Residue of Specified Penetration¹

This standard is issued under the fixed designation D 243; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method is used to thermally reduce cutback asphalt, a road oil or a semisolid asphalt, having a penetration greater than 100, to a residue of specified penetration. It is primarily used with slow-curing cutback asphalt as specified in Specification **D 2026**.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.3 **Warning**—Mercury has been designated by the United States Environmental Protection Agency (EPA) and many state agencies as a hazardous material that can cause central nervous system, kidney and liver damage. Mercury, or its vapor, may be hazardous to health and corrosive to materials. Caution should be taken when handling mercury and mercury containing products. See the applicable product Material Safety Data Sheet (MSDS) for details and EPA's website—<http://www.epa.gov/mercury/faq.htm>—for additional information. Users should be aware that selling mercury, mercury-containing products, or both, into your state may be prohibited by state law.

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 precautionary statements are given in **Note 2**.

2. Referenced Documents

2.1 *ASTM Standards:*²

D 5 Test Method for Penetration of Bituminous Materials
D 2026 Specification for Cutback Asphalt (Slow-Curing Type)

E 1 Specification for ASTM Liquid-in-Glass Thermometers
E 220 Test Method for Calibration of Thermocouples By

Comparison Techniques

3. Summary of Test Method

3.1 The material to be tested is rapidly heated to 249°C (480°F) and maintained at 249° to 260°C (480° to 500°F) during evaporation of the volatiles. Penetration of the residue is determined and if not within the specified limits, the evaporation procedure is repeated. Change in sample mass is used to calculate the percentage of residue having the specified penetration.

4. Significance and Use

4.1 This test method is used to determine the percentage of residue having a specified penetration at 100 g/5 s at 25°C (77°F). This test method provides a residue for quality control or for use in other tests as desired.

5. Apparatus

5.1 The apparatus shall consist of a container, heating bath, hot plate, and thermometric device, with necessary accessory apparatus as follows:

5.1.1 *Container*—The container in which the sample is to be tested shall be a flat-bottom, cylindrical seamless tin box, approximately 70 mm in diameter and 45 mm in depth.

NOTE 1—Containers known in the pharmaceutical industry as seamless “ointment boxes” may be obtained in dimensions conforming to the above requirements.

5.1.2 *Heating Bath*—The heating bath shall be a cast-iron air bath, or equivalent, permitting the immersion of the container to a depth of 32 ± 5 mm through an opening 3 ± 2 mm larger in diameter than the container. It shall support the container 6 ± 2 mm above the hot plate, and with at least 6.4 mm free air space between the sides of the container and of the air bath below the opening. A suitable air bath is shown in **Fig. 1**.³

5.1.3 *Hot Plate*—The air bath shall be heated upon a suitably mounted hot plate, heated either electrically or by

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.46 on Durability and Distillation Tests.

Current edition approved July 15, 2008. Published August 2008. Originally approved in 1926. Last previous edition approved in 1997 as D 243–97.

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 A source of supply of the apparatus that meets the requirements of this test method is available from Humboldt Mfg. Co., 7300 Agatite Ave., Norridge, IL, 60706–4704, as part number H-2480. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.