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Standard Test Method for Determination of Draindown Characteristics in Uncompacted Asphalt Mixtures¹

This standard is issued under the fixed designation D6390; 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 the amount of draindown in an uncompacted asphalt mixture sample when the sample is held at elevated temperatures comparable to those encountered during the production, storage, transport, and placement of the mixture. The test is particularly applicable to mixtures such as porous asphalt (open-graded friction course) and stone matrix asphalt (SMA)

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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 *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

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

D979 Practice for Sampling Bituminous Paving Mixtures

D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing

D6926 Practice for Preparation of Bituminous Specimens Using Marshall Apparatus

E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves

3. Terminology

3.1 *Definitions:*

3.1.1 *draindown*—for the purpose of this test method, draindown is considered to be that portion of material which separates itself from the sample as a whole and is deposited outside the wire basket during the test. The material which drains may be composed of either asphalt binder or a combination of asphalt binder, additives, or fine aggregate.

4. Summary of Test Method

4.1 A sample of the asphalt mixture to be tested is prepared in the laboratory or obtained from field production. The sample is placed in a wire basket which is positioned on a plate or other suitable container of known mass. The sample, basket, and plate or container are placed in a force draft oven for one hour at a pre-selected temperature. At the end of one hour, the basket containing the sample is removed from the oven along with the plate or container and the mass of the plate or container containing the drained material, if any, is determined. The amount of draindown is then calculated.

5. Significance and Use

5.1 This test method can be used to determine whether the amount of draindown measured for a given asphalt mixture is within specified acceptable levels. The test provides an evaluation of the draindown potential of an asphalt mixture during mixture design and/or during field production. This test is primarily used for mixtures with high coarse aggregate content such as porous asphalt (open-graded friction course) and stone matrix asphalt (SMA).

¹ This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.25 on Analysis of Bituminous Mixtures.

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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.

6. Apparatus

6.1 *Forced Draft Oven*, capable of maintaining the temperature in a range from 120 to 175°C and the set temperature to within $\pm 2^\circ\text{C}$.

6.2 *Plates*, or other suitable containers of appropriate size. The plates or containers used shall be of appropriate durability to withstand the oven temperatures. Cake pans or pie tins are examples of suitable types of containers.

6.3 *Standard basket* meeting the dimensions shown in Fig. 1. The basket shall be constructed using standard 6.3 mm sieve cloth as specified in Specification E11.

6.4 *Balance*—A balance readable to 0.1g and conforming to the requirements of Specification D4753, GP2.

7. Sample Preparation

7.1 *Laboratory Prepared Samples:*

7.1.1 *Number of Samples*—For each mixture tested, the draindown characteristics shall be determined at two different temperatures. The two temperatures shall be the anticipated plant production temperature as well as 10°C above (see Note 1). For each temperature, duplicate samples shall be tested. Thus for one asphalt mixture, a minimum of four samples will be tested.

7.1.2 Dry the aggregate to a constant mass and sieve it into appropriate size fractions as indicated in Practice D6926.

7.1.3 Determine the anticipated plant production temperature for the specific mix to be tested based on the specifications, mix design, or recommendations of the binder supplier.

7.1.4 Place into separate pans for each test sample the amount of each size fraction required to produce completed mixture samples having a mass of 1200 ± 200 g. The aggregate fractions shall be combined such that the resulting aggregate blend has the same gradation as the job-mix formula. Place the aggregate samples in an oven and heat to a temperature not to exceed the temperature established in 7.1.1.

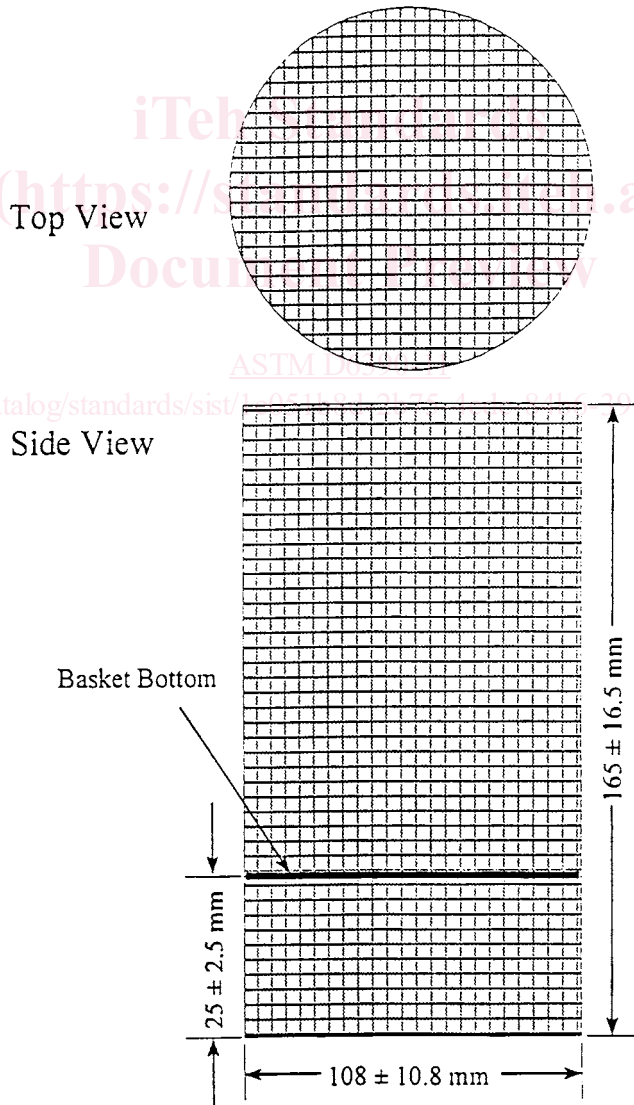


FIG. 1 Wire Basket Assembly (Not to Scale)