Designation: D6930 – 10

Standard Test Method for Settlement and Storage Stability of Emulsified Asphalts[1]

This standard is issued under the fixed designation D6930; 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 ability of an emulsified asphalt to remain as a uniform dispersion during storage. It is applicable to emulsified asphalts composed principally of a semisolid or liquid asphaltic base, water, and an emulsifying agent.

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 test method 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]

D6934 Test Method for Residue by Evaporation of Emulsified Asphalt

3. Significance and Use

3.1 This test method is useful for determining, in a comparatively short time, the storage stability or settlement of an emulsified asphalt. It is a measure of the permanence of the dispersion as related to time, but it is not to be construed to have significance as a measure of other stability aspects involved in use.

4. Summary of Test Method

4.1 This test method determines the difference in percent residue of samples taken from the top and bottom of material placed in undisturbed simulated storage for a specified time period. The result is expressed by determining the difference between the percent residue of the top and bottom samples for the storage cylinder.

5. Sample Conditioning for Testing

5.1 All emulsified asphalts shall be properly stirred to achieve homogeneity before testing.

5.2 All emulsified asphalts with viscosity testing requirements of 50°C shall be heated to 50 ± 3°C in the original sample container in a water bath or oven. The container should be vented to relieve pressure. After the sample reaches 50 ± 3°C, stir the sample to achieve homogeneity.

5.3 Emulsified asphalts with viscosity testing requirements of 25°C should be mixed or stirred at 25 ± 3°C in the original sample container to achieve homogeneity.

NOTE 1—Emulsified asphalts with viscosity testing requirements of 25°C may be heated and stirred as specified in 5.2, if necessary. In the event the 5.2 method is used, the sample should be cooled to 25 ± 3°C before testing.

6. Apparatus

6.1 *Cylinder*—500 mL glass cylinder, with pressed or molded glass base and cork, rubber, or glass stopper, having an outside diameter of 50 ± 5 mm.

NOTE 2—The use of a cylinder containing *side arm* glass tubes to permit the siphoning of the material rather than pipetting is an acceptable alternative method.

6.2 *Glass Pipet*—A 50 mL siphon glass-tube pipet of optional form.

6.3 *Balance,* capable of weighing 1000 g to 0.1 g.

6.4 *Beakers*—Two 1000 mL glass or metal beakers.

6.5 *Stir Rods*—Glass or Stainless Steel with rounded ends.

6.6 *Oven*—Capable of maintaining a temperature of 163 ± 3°C.

7. Procedure

7.1 Bring the emulsified asphalt to room temperature, 22°C to 28°C. Place a 500 mL representative sample in the glass cylinder. Stopper the cylinder and allow it to stand undisturbed, at laboratory air temperature 22°C to 28°C, for 24 h for storage stability or 5 days for settlement test. After standing for this period, remove approximately 55 mL of emulsified asphalt from the top of the cylinder by means of the pipet or siphon without disturbing the remainder of the sample. Thoroughly stir the 55 mL portion.

[1] This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.42 on Emulsified Asphalt Test.

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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.

NOTE 3—If the cylinder with side arms is used, siphoning is not required. Obtain a 55 mL sample from the upper arm, then drain off 390 mL from the lower arm.

7.2 Weigh 50.0 ± 0.1 g of the sample into a weighed 1000 mL glass or metal beaker that has been previously weighed with a glass rod.

7.3 After removal of the top portion, siphon off the next 390 mL (approximate) from the cylinder. Thoroughly stir the emulsified asphalt remaining in the cylinder. Weigh 50.0 ± 0.1g into a previously weighed 1000 mL glass or metal beaker with a glass rod.

7.4 Adjust the temperature of the oven to 163 ± 3°C and place the beakers containing the rods and sample in the oven for 2 h. At the end of this period, remove each beaker and thoroughly stir the residue. Replace in the oven for 1 h, then remove the beakers from the oven, allow to cool to ambient temperature, and weigh, with the rods (see Test Method D6934).

NOTE 4—Excercise care to prevent loss of asphalt from the beaker through foaming or splattering, or both. Also, the placing of beakers and emulsified asphalt samples in a cold or warm oven, and bringing the oven and sample up to a temperature of 163°C together is permissible. If preferred, preliminary evaporation of water may be accomplished by careful heating on a hot plate, followed by oven treatment at 163°C for 1 h.

8. Calculation & Report

8.1 Calculate the storage stability or settlement for the cylinder as follows:

$$\text{storage stability, \% (24 h)} = B - A \quad (1)$$

$$\text{settlement, \% (5 days)} = B - A$$

where:

A = the percentage of residue from the top sample, and

B = the percentage of residue from the bottom sample.

NOTE 5—If, for the individual cylinder, the percent residue of both the top and bottom samples is less than the percent residue of the emulsified asphalt, the result is considered suspect and the test should be repeated. If, for individual cylinder, the percent residue of both the top and bottom samples is greater than the percent residue of the emulsified asphalt, the result is considered suspect and the test should be repeated.

8.2 Report the storage stability or settlement as the cylinder result.

9. Precision and Bias

9.1 The following criteria should be used for judging the acceptability of results (95 % probability).

9.2 *Repeatability*—Duplicate results by the same operator should not be considered suspect unless they differ by more than the following amount:

Storage stability (24 h) – 0.5 weight %

Settlement (5 day) -

Settlement, weight %	Repeatability
0 to 1.0	0.4 weight %
above 1.0	5 % of the mean

9.3 *Reproducibility* The results submitted by each of two laboratories should not be considered suspect unless they differ by more than the following amount:

Storage Stability (24 h) – 0.6 weight %

Settlement (5 day) -

Settlement, weight %	Reproducibility
0 to 1.0	0.8 weight %
above 1.0	10 % of the mean

10. Keywords

10.1 asphalt; asphalt emulsion; cationic emulsified asphalt; emulsified asphalt; storage stability; settlement