



Standard Test Methods for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus¹

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1. Scope

1.1 These test methods cover the determination of (1) the resistance to deformation of compacted bituminous mixtures by measuring the lateral pressure developed when applying a vertical load by means of the Hveem stabilometer and (2) the cohesion of compacted bituminous mixtures by measuring the force required to break or bend the sample as a cantilever beam by means of the Hveem cohesiometer.²

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.*

1.3 The values stated in acceptable metric units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

D 1561 Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor³

D 3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials³

2.2 California Department of Transportation Standards:

Test 306 Method of Test for Cohesiometer Value²

Test 366 Method of Test for Stabilometer Value²

3. Significance and Use

3.1 The results of the deformation and cohesion tests can be used for specification purposes or for mix design purposes or both. For example, these values can be used for specification compliance testing of aggregate properties. They can also be used for specification compliance testing of the mix. The cohesion test is sometimes used for fine mixes such as sand mixes wherein cohesion, or tensile strength, is of major or

primary importance. The cohesion test is also sometimes used for the design of cold mixes containing emulsified asphalt.

RESISTANCE TO DEFORMATION

4. Apparatus

4.1 *Stabilometer*—The Hveem stabilometer (Fig. 1 and Fig. 2) is a triaxial testing device consisting essentially of a rubber sleeve within a metal cylinder containing a liquid which registers the horizontal pressure developed by a compacted test specimen as a vertical load is applied.

4.2 *Testing Machine*—A compression testing machine having a minimum capacity of 44.5 kN (10 000 lbf). Fig. 3 shows the stabilometer in a testing machine. The 22-kN (50 000-lbf) capacity compression testing machine specified in Practice D 1561, is normally used to perform the stabilometer test.

4.3 *Test Specimen Push-Out Device*—A device, to push the specimen out of the mold (see Fig. 4 for an example).

4.4 *Oven*—An oven capable of maintaining a temperature of $60 \pm 3^\circ\text{C}$ ($140 \pm 5^\circ\text{F}$).

4.5 *Calibration Cylinder*—A hollow metal cylinder 101.6 ± 0.13 mm (4 ± 0.005 in.) in outside diameter by 140 ± 6.4 mm (5.5 ± 0.25 in.) high (for calibration purposes).

4.6 *Rubber Bulb*—For introducing air into the stabilometer.

4.7 *Follower*—One solid wall metal follower 101.2 mm (3.985 in.) in diameter by 140 mm (5½ in.) high (see Fig. 5 and Fig. 6).

5. Test Specimens

5.1 Test specimens shall be mixed and compacted in accordance with those procedures normally used. The procedure described in Practice D 1561 is a suitable procedure.

6. Adjustment of Stabilometer

6.1 Adjust the stabilometer base so that the distance from the bottom of the upper tapered ring (see Fig. 1) to the top of the base is 89 mm (3.5 in.).

6.2 Place the calibration cylinder (preheated to 60°C (140°F)) in place in the stabilometer. Seat it firmly on the stage, hold it in place with either the hand or a vertical load of 0.45 kN (100 lbf) in the testing machine, and apply a horizontal pressure of exactly 34.5 kPa (5 psi). When applying the 34.5-kPa pressure, always start below or drop below this value, then bring the pressure up to 34.5 kPa (5 psi) and gently tap the dial to remove any slack in the system. Adjust the turns

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² A more detailed description of the procedures for performing the tests is available on request from the California Dept. of Transportation, 5900 Folsom Blvd., Sacramento, CA 95819. Also available is a procedure containing details regarding the operation and calibration of the stabilometer and the replacement of the stabilometer diaphragm.

³ *Annual Book of ASTM Standards*, Vol 04.03.