

Colorado Procedure – Laboratory 2211-15

Standard Method of Test for

Elastic Recovery

(This procedure is used in conjunction with AASHTO T 51.)

1. SCOPE

- 1.1 The elastic recovery of a polymer modified asphalt cement is evaluated by the percentage of recoverable strain measured after elongation during a conventional ductility test. Unless otherwise specified, the test shall be made at the temperature of 77°F (25°C ± 0.5°) and with a speed of 50 mm/min. ± 5.0%.

2. REFERENCE DOCUMENTS

- 2.1 AASHTO T 51: Ductility of Asphalt Materials
- ASTM E 1: Specification for ASTM Liquid-in-Glass Thermometer

3. APPARATUS

3.1 *Molds*

- 3.1.1 *Mold* - (Method A) This mold is used in the testing of superpave material. The mold shall be similar in design to that described for use in the ductility test (AASHTO T 51), Figure 1, except that the sides of the mold assembly, part a and a', shall have STRAIGHT sides, producing a test specimen with a cross section area of 100 mm².

- 3.1.2 *Mold* - (Method B) This mold is used in testing residue from polymer modified emulsions. The mold shall be similar in design to that described for use in the ductility test (AASHTO T 51), Figure 1.

- 3.2 *Water Bath* - The water bath shall be maintained at the specified test temperature, varying not more than 0.18°F (0.1°C) from this temperature.

- 3.3 *Testing Machine* - For pulling the briquette of bituminous material apart, any apparatus may be used which is so constructed that the specimen will be continuously immersed in water, as specified, while the two clips are pulled apart at an uniform speed without undue vibration.

- 3.4 *Thermometer* - An ASTM 63C or 63F thermometer shall be used.

- 3.5 *Scissors* - Any type of conventional scissors capable of cutting polymer modified asphalt at the test temperature.

METHOD A**4. PROCEDURE FOR TESTING SUPERPAVE MATERIAL**

- 4.1 Prepare test specimens and condition as prescribed by AASHTO T 51.
- 4.2 Elongate the test specimen at the specified rate to a deformation of 100 mm.
- 4.3 Immediately cut the test specimen into two halves, at the midpoint, using the scissors. Keep the test specimen in the water bath in an undisturbed condition for 1 hour.
- 4.4 After the 1 hour time period, move the elongated half of the test specimen back into position near the fixed half of the test specimen so the two pieces of polymer modified asphalt just touch. Record the length of the specimen as X.

5. REPORT

- 5.1 There is no designated CDOT Form used for recording / reporting information for this CP-L.
- 5.2 Calculate the percent recovery by the following procedure:

$$\text{Recovery, \%} = \frac{(100 - X)}{100} \cdot 100$$

Where: X = Specimen length in mm.

METHOD B**6. PROCEDURE FOR TESTING POLYMER MODIFIED EMULSIONS**

- 6.1 Prepare test specimens and condition as prescribe by AASHTO T 51.
- 6.2 Elongate the test specimen at the specified rate to a deformation of 200 mm.
- 6.3 After 200 mm elongation has been reached, stop the ductilometer and hold specimen in its elongated position for 5 minutes. At this time, cut the test specimen into two halves, at the midpoint, using the scissors. Keep the test specimen in the water bath in an undisturbed condition for 1 hour.
- 6.4 After the 1 hour time period, move the elongated half of the test specimen back into position near the fixed half of the test specimen so the two pieces of polymer modified asphalt just touch. Record the length of the specimen as b.

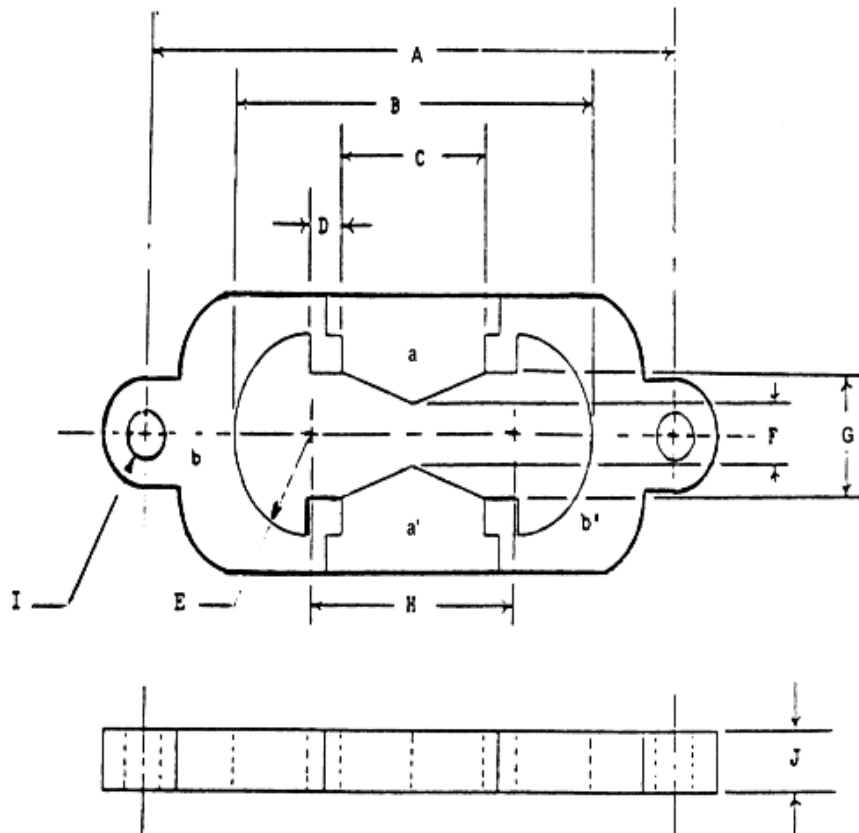
7. REPORT

7.1 There is no designated CDOT Form used for recording / reporting information for this CP-L.

7.2 Calculate the percent recovery by the following procedure:

$$\text{Recovery, \%} = \frac{(200 - b)}{200} \cdot 100$$

Where: b = Specimen length in mm.



- A—Distance between centers, 111.5 to 113.5 mm.
- B—Total length of briquet, 74.5 to 75.5 mm.
- C—Distance between clips, 29.7 to 30.3 mm.
- D—Shoulder, 6.8 to 7.2 mm.
- E—Radius, 15.75 to 16.25 mm.
- F—Width at minimum cross section, 9.9 to 10.1 mm.
- G—Width at mouth of clip, 19.8 to 20.2 mm.
- H—Distance between centers of radii, 42.9 to 43.1 mm.
- I—Hole diameter, 6.5 to 6.7 mm.
- J—Thickness, 9.9 to 10.1 mm.

FIG. 1 Mold for Ductility Test Specimen