OHD L-41
METHOD OF TEST FOR
SEPARATION OF POLYMER FROM POLYMER MODIFIED ASPHALT CEMENT

METHOD A:

I. **SCOPE.** The separation of polymer from asphalt during hot storage is evaluated by comparing the ring and ball softening points of top and bottom samples taken from a conditioned sealed tube of polymer modified asphalt. The conditioning consists of placing a sealed tube of polymer modified asphalt in a vertical position in a 325°F (163° C) oven for a two (2) day period.

II. **REFERENCED DOCUMENTS.**

A. AASHTO T 53, Softening Point by Ring and Ball Apparatus in Water.

B. AASHTO M 92, Specification for Wire Cloth Sieves for Testing Purposes

III. **APPARATUS.**

A. **Aluminum Tubes** - The tubes are used to hold the test sample during the conditioning. The cylinders are approximately 1" (25 mm) diameter by 55" (140 cm) length blind aluminum tubes.

Note: Aluminum tubes may be obtained from Sheffield Industries, P. O. Box 351, New London, Connecticut, 06320. Telephone Number (203) 442-4451.

B. **Oven** - An oven capable of maintaining 325° ± 9°F (163° ± 5° C).

C. **Freezer** - A freezer capable of maintaining 19° ± 9°F (-7° ± 5° C).

D. **Rack** - A rack capable of holding the aluminum tubes in a vertical position in an oven or in the freezer.

E. **Spatula and Hammer** - The spatula must be rigid and sharp to allow cutting of the tube containing the polymer modified asphalt when it is at a low temperature.

IV. **PROCEDURE.**

A. Place the empty tube, sealed end down in the rack.

B. Carefully heat the sample until sufficiently fluid to pour. Care should be taken to avoid localized overheating. Strain the melted sample through a 300 µm sieve conforming to AASHTO M 92. After a thorough stirring, pour 50.0 grams into the vertically held tube. Fold the excess tube over two times and crimp to seal.

C. Place the rack containing the sealed tubes in a 325° ± 9°F (163° ± 5° C) oven. Allow the tubes to stand undisturbed in the oven for a period of 48 ± 1 hours. At the end of the heating period, remove the rack from the oven and immediately place in the freezer, at 19° ± 9°F (-7° ± 5° C), taking care to keep the tubes in a vertical position at all times. Leave the tubes in the freezer for a minimum of four (4) hours to completely solidify the sample.

D. Upon removing the tube from the freezer, place the tube on a flat surface. With the spatula and hammer, cut the tube into three (3) equal length portions. Place the top and bottom portions into separate marked beakers. Place the beakers in a 325° ± 9°F (163° ± 5° C) oven until sufficiently fluid to remove the pieces of aluminum tube.

E. After a thorough stirring, pour the top and bottom samples into the appropriately marked rings for the ring and ball softening point test. Prepare the apparatus and perform the test in accordance with AASHTO T 53.

Note: Other residue tests such as viscosity at 275° F(135°C) or IR analysis may be run, if desired.

F. The top and bottom sample from the same tube should be tested at the same time to minimize variability in the procedure.

V. **REPORT.** Report the difference in softening point of the top and bottom portions of the sample to the nearest 0.2°F (0.1° C).

METHOD B:

I. **SCOPE.** This test is a simple qualitative test for compatibility of low density polymers in asphalt.

II. **APPARATUS.**

A. **Containers.** Standard 6 fl.oz. (175 ml) metal sample cups 1.85 inches High x 2.75 inches I.D. (47mm H x 70 mm I.D.).

B. **Oven.** An oven capable of maintaining 275° ± 9°F (135° ± 5° C).

III. **PROCEDURE AND REPORT.**

A. After a blend of polymer in asphalt has been prepared and is still at elevated temperature, pour enough of the mix into a clean 6 fl.oz. (175 ml) metal test cup to fill it to the formed roll on the cup (approximately 0.25 inches (6.4 mm) from top). Place the sample in a controlled temperature oven at 275°F (135° C) for 15 to 18 hours. Remove carefully from oven without disturbing the surface and observe the sample. After the initial observation, a spatula can be used to gently probe the sample and check consistency of any surface layer and check for sludge on the bottom. These observations and tests should be done while the sample is still hot, within five (5) minutes after removal from the oven.

B. Depending on the physical characteristics of the polymer and compatibility of the particular asphalt/polymer system, varying conditions will be noted. These are described and should be reported as follows:

DESCRIPTION	REPORT
Homogeneous, no skinning or sludge	HOMOGENOUS
Slight polymeric skin at edges of cup	SLIGHT EDGE SKINNING
Thin polymeric skin on entire surface	THIN TOTAL SKINNING
Thick polymeric skin 1/32"+ (0.8 mm +) on entire surface	THICK TOTAL SKINNING
No surface skinning but thin sludge at bottom of container	THIN BOTTOM SLUDGE
No surface skinning but thick 1/4"+ (6.4 mm +) sludge at bottom of container	THICK BOTTOM SLUDGE