Bureau of Materials and Physical Research
Illinois Laboratory Test Procedure
Effective Date: January 1, 2007

Evaluation of Asphalt Release Agents

Reference Test Procedure(s):

1. Illinois Specification 101, Minimum Requirements for Electronic Balances

2. AASHTO M 92 (Illinois Modified), Wire Cloth Sieves for Testing Purposes

3. AASHTO M 231, Weighing Devices Used in the Testing of Materials

4. ASTM E 29 (Illinois Modified), Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

To maintain brevity in the text, the following will apply:
Example: AASHTO M 92 (Illinois Modified) will be designated as "M 92."
ASTM E 29 (Illinois Modified) will be designated as "ASTM E 29."

1. GENERAL

   This procedure describes the testing performed to evaluate all asphalt release agents submitted for use on Department projects. Evaluation of asphalt release agents is based on the percent loss or gain of a sample of hot-mix asphalt (HMA) after it has been immersed in undiluted release agent and agitated for 20 minutes in an ultrasonic cleaner.

   All rounding shall be according to ASTM E 29.

2. EQUIPMENT

   a. Glass Beaker. The volume of the beaker shall be two to three times the loose volume of the test sample.

   b. Ultrasonic Cleaner.

   c. Oven. The oven shall be capable of maintaining 230 ± 9 °F (110 ± 5 °C).

   d. Sieve. No. 200 (μm 75) sieve of minimum diameter 12 in. (300 mm) manufactured according to M 92.

   e. Balance or Scale. The balance or scale shall conform to M 231 and Illinois Specification 101. Refer to the requirements for coarse aggregate CA/CM 6 through 19.

3. MATERIAL

   a. Hot-Mix Asphalt (HMA). A 200 ± 5 g sample of HMA having nominal maximum aggregate size of either 3/8 in. (9.5 mm) or 1/2 in. (12.5 mm).

   b. Asphalt Release Agent. A 1 quart (1 liter) sample of undiluted asphalt release agent submitted per the Department's Asphalt Release Agent Submittal for Testing and Approval.

4. PROCEDURE

a. Place the HMA sample in a glass beaker, and record the mass to the nearest 0.1 g.

b. Pour the sample of undiluted asphalt release agent into the beaker completely immersing the HMA, place in an ultrasonic cleaner, and agitate for 20 minutes. Note any color change or darkening of the liquid, which would indicate stripping of the asphalt.

c. Remove the beaker from the ultrasonic cleaner. Drain the release agent from the beaker, and with room temperature water, rinse the HMA sample thoroughly over a No. 200 (75 μm) sieve.

d. Return the washed HMA sample to the beaker, and place the beaker in an oven at 230 ± 9 °F (110 ± 5 °C) for 24 hours. Remove the beaker containing the HMA and record the mass to the nearest 0.1 g.

5. CALCULATIONS

a. Calculate the percent loss or gain of the initial sample mass as follows:

$$\Delta W = \left(\frac{W_i - W_f}{W_i} \right) \times 100$$

Where: ΔW is the percent change in the HMA sample mass in percent,

W_i is the initial mass of the HMA sample to the nearest 0.1 g, and

W_f is the final mass of the HMA sample after dry back to the nearest 0.1 g

Any change in color of liquid, stripping of asphalt, or mass loss/gain greater than 0.10 % shall be reason for rejection.

After evaluation and approval, the asphalt release sample will be fingerprinted by infrared analysis using Fourier Transform Infrared (FTIR) spectroscopy.