GDT 56

A. Scope

For a complete list of GDTs, see the Table of Contents.

Use this test method to determine the heat stability of a liquid anti-strip additive in bituminous mixtures. Use this method to evaluate an anti-strip additive before placing it on the Qualified Products List or to evaluate the effectiveness of the additive in the mix manufactured at a hot mix plant.

B. Apparatus

The apparatus consists of the following:

1. Balances: Use balances that are accurate to the nearest 0.0002 lb (0.1 g).
2. Hot-Plate, Gas Burner, or Stove
3. Watch or Timer
4. Metal Container: Use a non-corrosive metal beaker with a volume of approximately 0.5 gal (2000 ml) for boiling the asphaltic concrete mixture. The container is equipped with a shelf made of No. 10 (2.00 mm) wire mesh elevated 1 in (25 mm) off the bottom.
5. Pans: Use shallow, 12 in (305 mm) diameter pans, or equivalent.
6. Spatula: Use a spatula with a stiff blade.
7. Quart Can: Use a quart can or similar container for treating the asphalt cement with anti-strip additive.
8. Other Equipment: Use equipment necessary to perform AASHTO T 49 and T 202.
9. Scoop: Standard Metal Scoop that holds 8-10 ounces

C. Sample Size and Preparation

The two alternatives presented differ with the intended use of the test.

1. Alternate 1: Approving Anti-Strip Additives for the Qualified Products List
    a. Heat the asphalt cement to 325 °F (163 °C).
    b. Thoroughly mix in 0.5 percent of the additive by weight of the asphalt cement.
    c. Maintain the treated asphalt cement at 325 °F (163 °C) for 96 hours.
    d. Ensure that mixing temperatures conform to AASHTO T 245.
    e. Prepare two 250g batches of a laboratory standard aggregate with the gradation shown below for the stripping test.

NOTE: The laboratory-standard aggregate has a known history of stripping problems, and the laboratory-standard asphalt is an PG-67-22 normally used in the laboratory for mix design purposes.

    f. Ensure that the mix from the stripping test meets the following gradation requirements:

Size	Percent Passing
1/2 in (12.5 mm)	100
3/8 in (9.5 mm)	95-100
No.4 (4.75 mm)	60-70
No. 8 (2.36 mm)	44-46
No. 50 (300 µm)	18-22
No. 200 (75 µm)	5.6-6.5
%AC	5.25-7.0

g. Use the optimum asphalt content to mix the two specimens using the laboratory-standard asphalt cement treated with the additive in question.

h. Perform the stripping test in Procedures, step 2 after the 96-hour curing period and before the mix temperature falls below 250 °F (121 °C).

i. The additive is considered heat-stable if no more than 5 percent of the particles become totally or partially uncoated.

j. After approving a liquid anti-strip additive with this test, subject it to GDT 66 to determine diametral tensile strength. The materials must meet test requirements as outlined in Section 828 of the Standard Specifications.

2. Alternate 2: Evaluating Anti-strip Additives at Hot Mix Plants

NOTE: Carefully handle the sample and maintain an adequate mix temperature, according to the type of mix you are sampling.

a. Start the water boiling at the test site. It should be boiling by the time you arrive with the test sample.

b. Prior to taking sample from haul vehicle place scoop inside an oven to preheat. Keep the scoop preheated. When the scoop is preheated, it will not cool down the mix.

c. As soon as the mix has been loaded onto the haul vehicle, take one representative large shovel full.

NOTE: Perform the next steps within 10 minutes after the mix comes out of the plant.

d. Place the sample gently into a bag or container so that the mass remains intact.

e. Immediately take the bag or container to the testing area where the container of water is already boiling slowly.

f. Break open the mass of material sampled, use approximately [0.44 to 0.66 lbs (200 to 300 g)] and perform the appropriate tests.

D. Procedures

1. Asphalt Cement

a. Test the thermoplastic asphalt cement with and without the heat-stable anti-strip additive.

b. When you add the anti-strip additive, it shall not change the asphalt cement penetration at 77 °F (25 °C) by more than 3 mm nor viscosity at140 °F (60 °C) by more than 1.68 lbs/in (300 poises) per second.

c. Approve additives based on tests performed with the laboratory standard asphalt cement. However, the specific asphalt to be used on the project must comply with Section 820 of the Standard Specifications.

2. Stripping Test (Boil Test) for Asphaltic Concrete Mixture

a. Use a preheated scoop to transfer 8 to 10 ounces of the mix from the material sampled [approximate 0.44 to .66 lbs (200 to 300 g)] into the boiling water for 10 minutes

b. Drain off the water and dump the mix onto an absorptive paper product.

c. Let the mix cool at room temperature until dry.

d. Do not move or disturb the mix until you visually inspect the material. A stripped particle is one that visually appears to have the asphalt cement totally or partially removed.

E. Calculations

No calculations are necessary for these tests.

F. Report

Report the visual inspection of the stripping test result to the nearest 5 percent for the 96-hour test or field test, whichever applies, on Form FDCS 159.