



DETERMINING SPECIFIC GRAVITY OF ASPHALT BINDER

SCOPE

This test method provides the procedure for determining the specific gravity of asphalt binder, G_b , in the District Laboratories.

APPARATUS

1. Water bath and thermometer (ASTM 17F), which meet the requirements of AASHTO T49.
2. Test container, 3 oz. (90 mL), 6 oz. (180 mL) or 8 oz. (240 mL) capacity having the dimensions specified in AASHTO T49. The container is commonly referred to as seamless ointment tin.

NOTE: G_b may also be determined by using a 6 oz. (180 mL) or 8 oz. (240 mL) seamless ointment tin for the test container. The procedure is identical to that described in this method with the following exceptions: allow the sample to cool at room temperature for not less than 1 1/2 hours (Step 4); allow the sample to remain in the water bath at least 1 1/2 hours (Step 6).

3. Balance, having a capacity of at least 200 grams and readable to at least 0.1 gram.
4. Sample holder attached to the bottom of the balance by a single wire, which allows the sample to be weighed under water.
5. Water container of sufficient size to allow the sample to be weighed under water. A gallon can is suitable.

PROCEDURE

NOTE: Samples submitted in ointment tins for DSR tests may be used if transferred to a new ointment tin as outlined in the procedure.

1. Weigh the test container (without lid) to the nearest 0.1 gram.
2. Remove the lid from the sample container and place in an oven preheated to 260° to 290°F (127° to 143°C) until the sample reaches a temperature of at least 260°F (127°C). (The time required for this should be 1 to 1 1/2 hours depending on the size of the sample). Remove the sample from the oven and stir thoroughly with a spatula, being careful to avoid the inclusion of air bubbles. Then pour it into the test container until at least two thirds full.
3. Return the test container with the sample to the oven for approximately 10 minutes or until such time that no air bubbles are visible.
4. Loosely cover the test container and allow to cool at room temperature on a flat, level surface for a time period of not less than 1 hour.
5. Weigh the sample and test container (without lid) to the nearest 0.1 gram.

6. Place the sample in the water bath maintained at $77^{\circ} \pm 0.2^{\circ}\text{F}$ ($25^{\circ} \pm 0.1^{\circ}\text{C}$) and allow it to remain in the bath for at least 1 hour.
7. Remove the sample from the water bath and immediately weigh to the nearest 0.1 gram while it is fully submerged in water adjusted to 77°F (25°C).

CALCULATIONS

Calculate G_b to the nearest 0.001 as follows:

$$G_b \text{ at } 77^{\circ}\text{F} (25^{\circ}\text{C}) = \frac{B - A}{B - C - A/7.8}$$

- Where:
- A = weight of test container, grams
 - B = weight of test container plus sample, grams
 - C = weight of test container plus sample submerged in water, grams
 - 7.8 = specific gravity of the metal of the test container. (This is the specific gravity of ointment tins, which are commonly used. If suspect results occur this specific gravity should be redetermined.)

DOCUMENTATION

1. Generally, G_b is reported at 60°F (15.56°C). Convert the test result to 60°F (15.56°C) as follows:

When the test result is greater than 0.996, divide it by 0.9961.
When the test result is less than 0.996, divided it by 0.9952.
2. Always report the specific gravity, G_b , to 4 significant figures along with its temperature.



Test Containers