

State of Nevada
Department of Transportation
Materials Division

METHOD OF TEST FOR RESIDUE BY EVAPORATION OF POLYMER MODIFIED ASPHALT EMULSION

SCOPE

This test method is a procedure for determining the percentage of asphalt and polymer modifier in an asphalt emulsion.

SUMMARY OF TEST METHOD

A sample of the emulsion is placed in an oven to evaporate the water and the percent of residual asphalt is calculated. The residue from this test may then be used for additional testing.

APPARATUS

1. Containers, 355 mL (12 oz) covered cylindrical seamless metal containers, with an approximate diameter of 86 mm (3 3/8 in.) and depth of 57 mm (2 1/4 in.).
2. Balance, conforming to the requirements of M231, Class G2.
3. Oven, thermostatically controlled, capable of maintaining temperatures up to 163°C (325°F).
4. Water Bath (Optional), controlled temperature water bath capable of maintaining temperatures up to 71°C (160°F).
5. Gloves, heat resistant gloves capable of gripping the containers.
6. Stirring Rods, glass rods with flame polished ends, having an approximate diameter of 6.4 mm (1/4 in.) and length of 152.4 (6 in.).

PROCEDURE

All emulsions with viscosity requirements of 50°C (122 °F) should be heated to $50 \pm 3^\circ\text{C}$ ($122 \pm 5^\circ\text{F}$) in the original sample container in an oven or water bath set at a temperature not exceeding $71 \pm 3^\circ\text{C}$ ($160 \pm 5^\circ\text{F}$). The sample containers should be tightly sealed to avoid evaporation. Open the containers slowly to relieve pressure. After the sample reaches $50 \pm 3^\circ\text{C}$ ($122 \pm 5^\circ\text{F}$), stir the sample to achieve homogeneity. Emulsions with viscosity requirements of 25°C (77°F) should be at room temperature and stirred to achieve homogeneity.

Weigh 50 ± 0.1 g of the thoroughly mixed, emulsified asphalt into each of three containers, each container having previously been weighed with a glass rod and cover. Place the containers containing the rods and sample in the oven, the temperature of which has been adjusted to $163 \pm 2.8^\circ\text{C}$ ($325 \pm 5^\circ\text{F}$), for two hours. The containers should be loosely covered to avoid loss of material. At the end of this time period remove each container and stir the residue thoroughly until foaming, if any, ceases. Replace in the oven for one hour, then remove the containers from the oven, allow to cool to room temperature, and weigh, with the rods and covers.

When tests on the residue from the emulsion are required, replace the containers in the oven until the asphalt residue is sufficiently fluid to pour. Pour the residue into suitable containers and molds for making such tests as desired.

Note - Care must be taken to prevent loss of asphalt from the container through foaming or spattering, or both.

CALCULATION AND REPORT

Calculate the percentage of residue on each container as follows:

$$\text{Residue, percent} = 2(A - B)$$

where:

A = weight of container, rod, cover, and residue, g, and

B = tare weight of container, rod and cover, g.

Report the percentage of residue by evaporation as the average of the three results.