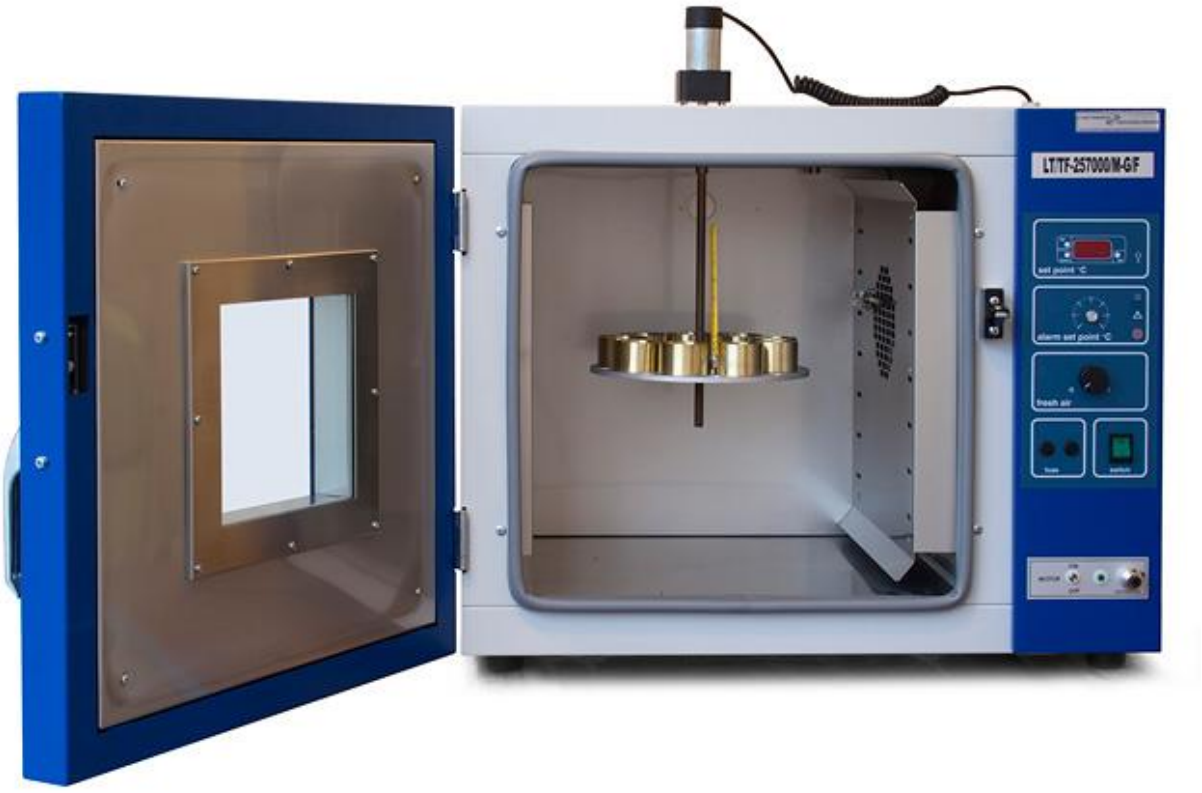
EXPERIMENT NO: 10

LOSS ON HEATING OF OIL AND ASPHALTIC COMPOUND

AASHTO DESIGNATION: T 47-83 (1993)
(ASTM DESIGNATION: D 6-80)



1. SCOPE

1.1 This method covers the determination of the loss in mass (exclusive of water) of oil and asphaltic compounds when heated as herein after prescribed.

2. REFERENCED DOCUMENTS

2.1 ASTM Standards:

E1 Specification for ASTM Thermometers

E145 Specification for gravity-convection and forced-ventilation ovens

3. APPARATUS

3.1 Oven: The oven shall be electrically heated and shall conform to the performance requirements of ASTM specification E 145, for Gravity-Convection and Forced-Ventilation Ovens. It shall comply with the following requirements.

3.1.1 Construction: The oven shall be rectangular with minimum interior dimensions of 330 mm (13 in.) in each direction. The oven shall have in front a tightly fitting hinged door, which shall provide a clear opening substantially the same as the interior height and width of the oven. The door may contain a window with dimensions of a least 100 by 100 mm (4 by 4 in.), and with two sheets of glass separated by an air space, through which a vertical thermometer located in the oven, may be read without opening the door, or the oven may be provided with an inner glass door, through which the thermometer may be observed on opening the outer door momentarily. The oven shall be adequately ventilated by convection currents of air and for this purpose shall be provided with openings for the entrance of air and for the exit of heated air and vapors.

3.1.2 Rotating Shelf: The oven shall be provided with a circular metal shelf having a minimum diameter of 250 mm (9.8 in.). The shelf shall suspend by a vertical shaft and centered with respect to the horizontal interior dimensions. The shelf shall be provided with a mechanical means for rotating it at the rate of 5 to 6 rpm. The shelf shall be vertically located as close to the center of the oven as permitted by compliance with the requirements regarding to thermometer placement.

3.2 Thermometer: An ASTM Loss on Heating Thermometer graduated in Celsius degrees, having a range from 155 to 170°C, and conforming to the requirements for Thermometer as prescribed in the ASTM Specification E1, for ASTM Thermometers.

3.3 Container: The container in which the sample is to be tested shall be of metal or glass, cylindrical in shape, and shall have a flat bottom. It's inside diameter and depth shall be 55mm (2.17 in.) and 35 mm (1.38 in.) respectively.

4. PROCEDURE

4.1 First test the material under examination for water and if water is present, remove it by suitable methods of dehydration before subjecting the material to the loss on heating test, or obtain another sample that is free from water.

4.2 Place 50.0±0.5 gm of the sample of the water free material in a container, cool the sample to room temperature and weigh to the nearest 0.01 gm. Bring the oven to a temperature of 163°C (325°F) and place the container with the weighed sample on recesses if the recommended shelf is used. Close the oven and rotate the shelf during the entire test at a rate of 5 to 6 rpm. Maintain the temperature at 163 ± 1°C (325±1.8°F) for 5 hrs, start counting the time when the temperature reaches 162°C, and in no case shall the total time that a sample is in the oven be more than 5h and 15 min. At the conclusion of the heating period, remove the sample from the oven, cool to room temperature, and weigh to the nearest 0.01 gm.

5. CALCULATIONS

5.1 Calculate the percentage loss to the nearest second decimal as follows:

$$\% \text{ loss} = [(A-B)/A'] * 100$$

Where, A= initial weight of the container plus sample
B = final weight of the container plus sample after heating
A′ = initial weight of the sample

6. PRECAUTIONS

6.1 Under ordinary circumstances a number of samples having about the same degree volatility may be tested at the same time. Samples varying greatly in volatility should be tested separately. When extreme accuracy is required not more than one material should be tested at one time and duplicate samples of it should be placed simultaneously in the oven to check the accuracy of result. Samples showing evidences of foaming during the test shall be rejected.

7. Reproducibility of Results

7.1 Up to 5 percent loss in mass the results obtained may be considered as correct within 0.5. Above 5 percent loss in mass, the numerical limit of error increases 0.01 for every 0.5 percent increase in loss by volatilization as follows:

Table 10.1: Numerical limit of error for loss above 5 percent.

Volatilization Loss (%)	Numerical Correction	True Volatilization Loss, (%)
5.0	± 0.50	4.50 to 5.55
5.5	± 0.51	4.99 to 6.01
6.0	± 0.52	5.48 to 6.52
10.0	± 0.60	9.40 to 10.60
15.0	± 0.70	14.30 to 15.70
25.0	± 0.90	24.10 to 25.90
40.0	± 1.20	38.80 to 41.20