

DEPARTMENT OF TRANSPORTATION
ENGINEERING SERVICE CENTER
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METHOD FOR DETERMINING THE EFFECT OF HEAT AND AIR ON ASPHALTIC MATERIALS

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "**SAFETY AND HEALTH**" in Section F of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. SCOPE

This method of test, developed by the Federal Highway Administration, is intended for the determination of the effects of heat and air on asphaltic materials when heated, as in hereafter prescribed. The loss in weight, percentage of original penetration, and ductility after heating are used as a measure of the effect of this test on asphaltic materials.

B. APPARATUS

1. Oven: The oven shall conform to the requirements specified in the Method of Test for Loss on Heating of Oil and Asphaltic Compounds, AASHTO Designation T-47, with the following exception:

The circular shelf shall be constructed so that it will support one or more sample containers, 140 mm in diameter, in a horizontal position.

2. Thermometer: The thermometer shall conform to the requirements specified in the Method of Test for Loss of Heating of Oil and Asphaltic Compounds, AASHTO Designation T-47.
3. Container: The container in which the sample is to be tested shall be a cylindrical aluminum pan 140 mm inside diameter and 10 mm deep with a flat bottom.
4. Sieve: One 300 μ m sieve conforming to the requirements prescribed in the Standard

Specifications for Sieves for Testing Purposes, AASHTO Designation M-92.

C. PREPARATION OF SAMPLE

The sample as received shall be free from water and shall be heated, if necessary, and thoroughly stirred and agitated to ensure a complete mixture before the portion for analysis is removed.

D. TEST PROCEDURE

1. In order to provide sufficient material for required tests on the residue, the test shall be performed in duplicate. The water-free sample shall be heated to a fluid condition and 50.0 ± 0.5 g poured into each of two tared containers, conforming to the requirements described under "Apparatus." Cool the containers with the samples to room temperature and weigh to the nearest 0.01 g. The oven shall be brought to 163°C, and the tared samples placed on the circular shelf, directly opposite to each other. The oven shall then be closed and the shelf rotated during the entire test period at a rate of 5 to 6 rpm. The temperature shall be maintained at $163 \pm 1^\circ\text{C}$, for 5 hours after the sample has been introduced and the oven has again reached that temperature. The 5-hour period shall start when the temperature reaches 162°C and in no case shall the total time that a sample is in the oven be more than 5 hours and 15 minutes. At the conclusion of the heating period, the samples shall be removed from the oven and allowed to cool to room temperature. They shall

then be weighed to the nearest 0.01 g and the loss due to heating shall be calculated for each sample. The average loss shall be used for reporting results.

2. Temperatures shall be determined by means of the specified thermometer, supported from the shaft of the circular shelf in a vertical position at a point equidistant from the center and the outer edge of the shelf, and with the bottom of the thermometer 6 mm above the shelf.
3. After the two samples have been weighed, they shall be placed on the circular shelf of the oven together with an 225 g deep ointment can resting on a piece of "transite". The oven shall be brought to a temperature of 163°C prior to placing the samples, 225 g can, and "transite" plate on the circular shelf. The oven shall then be closed and the shelf rotated during the entire heating period at a rate of 5 to 6 rpm. Fifteen minutes after the oven door is closed, the "transite" plate and 225 g ointment can, shall be removed and immediately each sample shall be poured into the ointment can. A putty knife or spatula with a flat edge shall be used to remove all of the material from the bottom of the containers. Immediately after completing this operation, the contents of the ointment can shall be thoroughly stirred. The material shall then be strained through a 300 μ m sieve, and after thorough stirring, poured into the ductility mold and penetration cup.

NOTE: It may be necessary to reheat the material prior to straining. This should be done at the lowest possible temperature.

4. The ductility test shall be performed as specified in the Standard Method of Test for Ductility of Bituminous Materials, AASHTO T-51. The penetration test shall be performed as specified in the Standard Method of Test for Penetration of Bituminous Materials AASHTO T-49.

E. REPORTING OF RESULTS

Test results are immediately reported on the appropriate asphalt test report form.

F. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A

(Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. Users of this method do so at their own risk.

REFERENCES:

**AASHTO Designations T-47, T-49, T-51,
and M-92**

End of Text (California Test 337 contains 2 Pages)