STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY

DEPARTMENT OF TRANSPORTATION
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METHOD OF TEST FOR TORSIONAL RECOVERY OF POLYMER MODIFIED ASPHALT EMULSION RESIDUE

A. SCOPE

This method of test describes the procedure to determine the amount of elasticity that a polymer has imparted to an asphalt. This elasticity is an indicator of the percent of polymer that has been added to the asphalt.

B. REFERENCES

AASHTO Designation: T 59-16, Standard Method of Test for Emulsified Asphalts

C. APPARATUS

1. A flat bottom, cylindrical, seamless container 55 mm (2.17 inch) in diameter and 35 mm (1.38 inch) in depth. This container is commonly known as a 3 oz. tin (see Diagram 1).

Diagram 1

2. Disc Assembly (see Diagram 2). The disc must be made of aluminum. The spider, pointer, and nut must be made of steel.
3. A 5/16 in. open-end or box-end wrench.

4. A stopwatch, clock, or other timing device having a precision of 1 s or less.
5. A flexible plastic scale graduated to the nearest 1 mm.

D. PROCEDURE

1. Obtain the residue by evaporation from six samples of polymer modified emulsified asphalt in accordance with AASHTO T 59, section 7.
2. Pour the hot residue from two of these samples into a container.
3. Immerse a disk assembly into the molten asphalt, align the notches in the spider with the container so that the disc is centered, and adjust the disc height such that the asphalt surface is even with the top of the disc.
4. Prepare the next two assemblies similarly.
5. Put the containers and assemblies into the 138°C (280˚ F) oven to allow bubbles to escape and to break the surface tension around the disc.
6. After ten minutes in the oven, remove the containers and assemblies and allow them to cool at room temperature for 2 hr.
7. Perform the following steps on each of the three samples:
   a. Mark the container for the reference points of 0˚ and 180˚ based on the pointer's location after mold preparation.
   b. Hold the container and spider rigidly.
   c. With a wrench attached to the top of the disc shaft, rotate the disc 180˚ and release it immediately. The rotation should be done at a steady rate taking approximately 5 s to accomplish.
   d. Begin timing the recovery at the release of the disc.
   e. After 30 s, mark the pointer's location on the container.
   f. After 30 min, mark the pointer's location on the container again.

E. CALCULATION

Calculate the percent recovery as follows:

$$Torsional\ Recovery, \% = 100\left[\frac{\mathrm{A}}{\mathrm{B}/2}\right]$$

where:

A = the arc on the container, in millimeters, between the mark at 30 s and the mark at 30 min.
B = the circumference of the container, in millimeters.

F. REPORTING OF RESULTS

Report the percent torsional recovery as the average of the three results.

G. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

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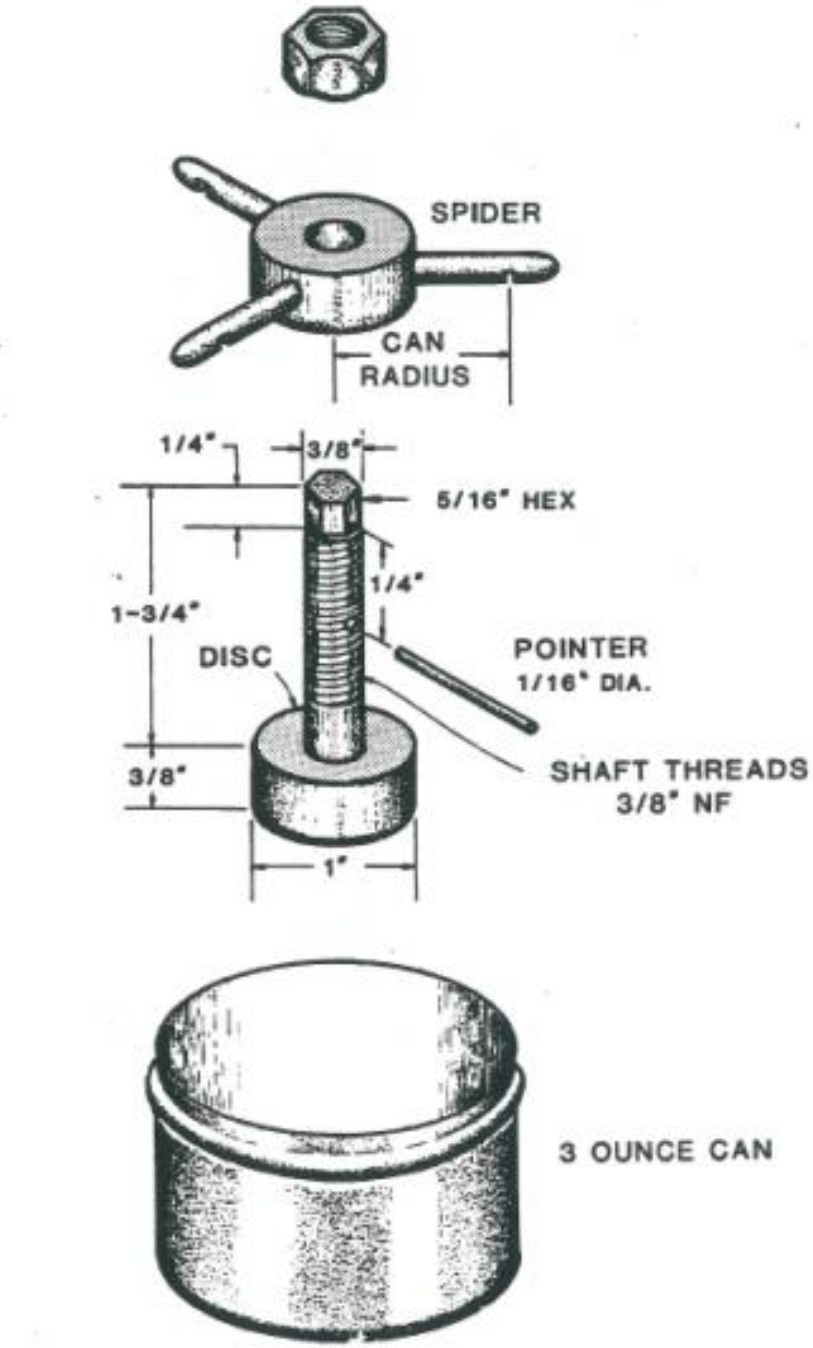
(California Test 332 contains 4 pages)



APPARATUS FOR RECOVERY TEST

Diagram 2