# METHODS OF SAMPLING AND TESTING
# MT 333-20
# METHOD OF TEST FOR THE TORSIONAL RECOVERY OF LATEX MODIFIED ASPHALT EMULSION RESIDUE

## 1 Scope

1.1 This test method provides an indication of the amount of elasticity that has been imparted to asphalt by the addition of latex. The asphalt used in this test has been recovered from an emulsion.

## 2 References

*AASHTO*
T 59 Emulsified Asphalts

## 3 Apparatus

3.1 *Sample container* – A flat-bottomed, cylindrical, seamless tin 55 mm (2.17 inch) in diameter and 35 mm (1.38 inch) in depth. The container is commonly known as a 3-ounce ointment tin.

3.2 *Disc and spider assembly* – This assembly is shown in Figure 1. The disc is made of aluminum. The spider assembly, bolt, and pointer are made of steel.

3.3 *Wrench* – A 9/16 inch open-end or box wrench.

3.4 *Timer* – A stopwatch, clock, or other timing device graduated in divisions of one second or less.

3.5 *Scale* – A paper scale, graduated in millimeters, at least 180 mm in length.

## 4 Procedure

4.1 A test consists of two (2) test assemblies (centered spider assemblies and containers).

4.2 Place the spider assembly on the container and adjust it so that it is centered, using the small nuts on the arms of the spider to maintain the adjustment. Adjust the depth of the disc in the container so that the top of the disc will not be below the surface of the asphalt. Remove the spider assembly from the container.

4.3 Obtain a latex modified asphalt residue sample by following the procedure outlined in AASHTO T 59, Emulsified Asphalt Residue By Evaporation, Section 7.

4.4 Transfer a sufficient quantity of the hot residue into the sample container to fill it to within ½ to ¼ inch from the top of the container. Immediately place the previously centered spider assembly on the container and adjust the depth of the disc to bring the top of the disc level with the surface of the asphalt.

4.5 Repeat Sections 3.2 through 3.4 for the second spider assembly container.

4.6 Place the two test assemblies in a 138°C (280°F) oven for ten minutes to allow air bubbles to escape and break the surface tension around the disc. Remove the assemblies from the oven and allow to cool to room temperature for two hours.

4.7 For each test assembly, tape a paper scale around the container and mark the location of the pointer. Make another mark 180° from the pointer (halfway around the container).

4.8 Holding the container and spider assembly rigidly, place the wrench on the bolt head and turn the bolt to the 180° reference mark and release immediately. The rotation should be done at a steady rate and be accomplished in approximately 5 seconds. Start the stopwatch when the bolt is released. Mark the location of the pointer on the scale when 30 seconds have elapsed, and again when 30 minutes have elapsed. Repeat the procedure with the second test assembly.

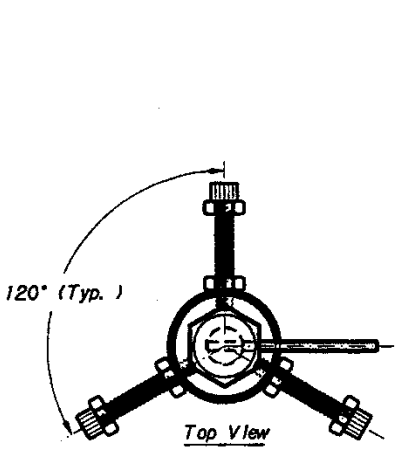
## 5 Calculation and Report

5.1 The percent of recovery following deformation is calculated as follows:

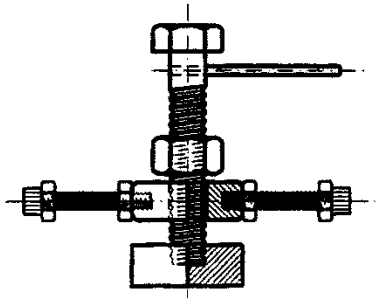
$$Percent\ Recovery = \left[\frac{A}{\left(\frac{B}{2}\right)}\right] * 100$$

Where:
A = The arc on the container, measured in millimeters, between the mark made after 30 seconds has elapsed, and the mark made after 30 minutes has elapsed.
B = The circumference of the can, measured in millimeters.

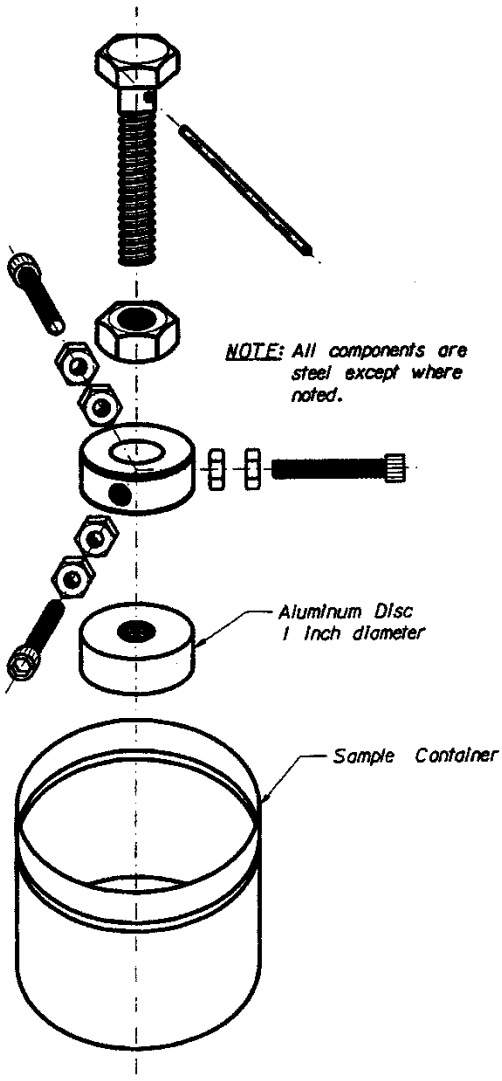
5.2 Report the percent recovery as an average of the two test assemblies.




Top View



Front View




Exploded View

**SPIDER ASSEMBLY**

Scale ~ N. T. S.

MONTANA DEPARTMENT OF TRANSPORTATION

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