
Test Procedure for

**MEASUREMENT OF ELASTIC RECOVERY OF
TENSILE DEFORMATION USING A DUCTILOMETER**



TxDOT Designation: Tex-539-C

Effective Date: August 1999

1. SCOPE

- 1.1 This procedure describes the method of measuring recovery of tensile deformation of an asphalt sample by using a standard ductilometer. The testing procedure uses similar equipment and methods as AASHTO T 51.
 - 1.2 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.
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2. APPARATUS

- 2.1 *Ductilometer and related equipment*, as specified by AASHTO T 51. There must also be some method available of stopping the ductilometer at a point in the test and holding the sample at a constant level of deformation.
 - 2.2 *Clock or watch*, capable of measuring a 5 min. \pm 10 sec. and a 1 hr. \pm 5 min. period.
 - 2.3 *Scissors*.
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3. PROCEDURE

- 3.1 Prepare the apparatus and the samples as specified in AASHTO T 51, Sections 5.1–5.3.
 - 3.2 Attach the sample clips to the pins or hooks of the ductilometer.
 - 3.3 Begin pulling the clips apart at a rate of 50 mm/min. (2 in./min.)
 - 3.4 When the sample elongation reaches 200 mm (8 in.), stop pulling the clips apart.
 - 3.5 If the sample breaks before 200 mm (8 in.) elongation, consider the test abnormal and fail the sample after obtaining this result several times.
 - 3.6 Hold the sample at 200 mm (8 in.) elongation for 5 min. \pm 10 sec.
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- 3.7 Cut the sample at its approximate center using the scissors. The cut ends of the sample will begin to draw apart.
- 3.8 Allow the sample to relax for 1 hr. \pm 5 min.
- 3.9 Manually move the sample clips together until the cut ends of the sample meet.
- 3.10 Record the elongation in mm (in.) indicated by the ductilometer when the cut ends of the sample are touching.
- 3.11 Calculate the elastic recovery using the equation shown in Section 4.
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4. CALCULATIONS

- 4.1 Calculate the elastic recovery as a percentage of the total elongation recovered by the sample during the test:

$$R = \frac{200 - E_f}{200} \times 100\%$$

Where:

R = the elastic recovery

E_f = the final elongation recorded in Section 3.9.