Test Procedure for

INDIRECT TENSILE STRENGTH TEST

TxDOT Designation: Tex-226-F

Effective Date: April 2025

1. SCOPE

1.1 This test method determines the tensile strength of compacted bituminous mixtures.

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.

2. APPARATUS

2.1 *Apparatus used in* Tex-241-F.

2.2 *Apparatus used in* Tex-207-F.

2.3 *Apparatus used in* Tex-227-F.

2.4 *Temperature Chamber or Heating Oven,* capable of attaining a temperature of at least 77°F with a temperature stability of 2°F.

2.5 *Loading Press,* capable of applying a compressive load at a controlled deformation rate of 2 in. per minute.

2.6 *Load Cell,* with a minimum capacity of 6,000 lb.

2.7 *Loading Strips,* consisting of 0.75 × 0.75 in. square steel bars. Machine the surface in contact with the specimen to the curvature of the test specimen.

3. SPECIMENS

3.1 *Laboratory-Molded Specimens*—Prepare four specimens in accordance with Tex-241-F. Specimen diameter must be 5.9 in., and height must be 2.4 ± 0.1 in.

3.1.1 Density of test specimens must be 93 ± 0.5%, except for Crack Attenuating Mix (CAM).

Note 1—Mixture weights for laboratory-molded specimens that achieve the density requirement typically vary between 2400 and 2600 g.

3.1.2 For CAM mixtures, mold test specimens to 95 ± 0.5% density.

Note 2—Mixture weights for laboratory-molded specimens that achieve the density requirement typically vary between 2400 and 2600 g.

3.2 *Core Specimens*—Specimen diameter must be 6 in., and height must be a minimum of 1.5 in. There is not a specific density requirement for core specimens.

4. PROCEDURE

4.1 *Laboratory-Molded Mixtures:*

4.1.1 Mold four specimens in accordance with Section 3.1.

4.1.2 Calculate the density of the specimens in accordance with Tex-207-F and Tex-227-F.

4.1.3 Allow the specimens to stand at room temperature (75 ± 5°F) for a minimum of 24 hr. before testing.

4.1.4 Test laboratory-molded specimens within three days of molding.

4.1.5 Proceed to Section 4.3.

4.2 *Roadway Cores:*

4.2.1 Obtain roadway cores in accordance with Tex-251-F, Part I, meeting the requirements of Section 3.2.

4.2.2 Trim the bottom or top of the core only when necessary in accordance with Tex-251-F, Part II. Remove any foreign matter and provide a level and smooth surface for testing.

4.2.3 Proceed to Section 4.3.

4.3 Record the density, height, and diameter of each molded specimen or roadway core.

4.4 Place the specimens or cores in the temperature chamber or oven for at least 1 hr. to ensure a consistent temperature of 77 ± 2°F (25 ± 1°C) throughout the specimen before testing. Do not leave the specimens or cores in the temperature chamber or oven for more than 24 hr.

4.5 Calibrate the loading press to use a deformation rate of 2 in. per minute.

4.6 Carefully place one specimen on the lower loading strip.

4.7 Slowly lower top loading strip into light contact with the specimen.

4.8 Zero the load cell.

4.9 Ensure the two loading strips remain parallel to each other during testing.

4.10 Apply the load at a controlled deformation rate of 2 in. per minute and record the total vertical load at failure of the specimen.

4.11 Repeat Sections 4.6 – 4.10 for each specimen.

5. CALCULATIONS

5.1 Calculate the tensile strength of the compacted bituminous mixture:

$$S_T = \frac{2F}{3.14x(hd)}$$

Where:

S_T = Indirect tensile strength, psi

F = Total applied vertical load at failure, lb.

h = Height of specimen, in.

d = Diameter of specimen, in.

6. REPORT

6.1 Report the following for each specimen:

- density,
- height,
- diameter,
- total load at failure, and
- indirect tensile strength.

6.2 Report the average indirect tensile strength of the tested specimens or cores to the nearest whole number.

7. TEST RECORD FORMS

7.1 Indirect Tensile Strength Test

8. ARCHIVED VERSIONS

8.1 Archived versions are available.