

Test Procedure for

CANTABRO LOSS



TxDOT Designation: Tex-245-F

Effective Date: **OCTOBER 2024**

1. SCOPE

- 1.1 This test method determines the abrasion loss of compacted hot-mix asphalt (HMA) specimens.
- 1.2 This test method measures the breakdown of compacted specimens utilizing the Los Angeles Abrasion machine. The percent of weight loss (Cantabro loss) is an indication of **permeable friction course** (PFC), **limestone rock asphalt** (LRA), and hot-mix cold-laid durability and relates to the quantity and quality of the asphalt binder. This procedure can be performed on other HMA mixtures for informational purposes.
- 1.3 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-206-F](#).
- 2.2 Apparatus used in [Tex-241-F](#).
- 2.3 Apparatus used in [Tex-207-F](#).
- 2.4 Apparatus used in [Tex-227-F](#).
- 2.5 Apparatus used in [Tex-410-A](#).
- 2.6 Temperature Chamber or Heating Oven, capable of maintaining $77 \pm 2^\circ\text{F}$ ($25 \pm 1^\circ\text{C}$).

3. SAFETY CONSIDERATIONS

- 3.1 Use ear protection.
- 3.2 Use a cartridge respirator or disposable paper mask to prevent inhalation of particulate.

4. SPECIMENS

- 4.1 Prepare two specimens in accordance with [Tex-241-F](#). Specimen diameter must be 5.9 in. (150 mm), and height must be 4.5 ± 0.2 in. (115 ± 5 mm).
Note 1—For hot-mix cold-laid and LRA material, prepare three specimens in accordance with [Tex-206-F](#). Specimen diameter must be 4 in. (101.6 mm), and height must be 2.0 ± 0.06 in. (50.8 ± 1.5 mm).

- 4.1.1 For PFC mixtures, mold test specimens to 50 gyrations (N_{design}).
Note 2— There is not a specific density requirement for PFC mixtures.
Note 3—Select the mixture weight for the molded PFC specimen based on the weights used in the mix design.
- 4.1.2 For other HMA mixtures, density of test specimens must be $93 \pm 0.5\%$.
Note 4—Mixture weights for specimens that achieve the density requirement typically vary between 4,200 and 4,500 g.
Note 5—These mixtures are normally tested for informational purposes only.
- 4.1.3 For hot-mix cold-laid and LRA mixtures, mold samples to density in accordance with the specification.
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5. PROCEDURE

- 5.1 Mold specimens in accordance with Section 4.
Note 6—Do not immediately extrude the specimen from the mold when dealing with asphalt-rich or tender mixtures to prevent deformation. Allow the mold to cool for approximately 10 min. or more in front of a fan.
- 5.2 Carefully remove the paper disks from the top and bottom of the specimens.
- 5.3 Cool molded specimens to room temperature and weigh. Record and designate the weight as A under Section 6.
- 5.4 Calculate the density of the specimens in accordance with [Tex-207-F](#) and [Tex-227-F](#).
- 5.5 Discard specimens not meeting the $93 \pm 0.5\%$ density requirement and mold new specimens in accordance with Section 4.
Note 7—This density requirement does not pertain to PFC, LRA, or hot-mix cold-laid material.
- 5.6 Allow the specimens to stand at room temperature ($75 \pm 5^\circ\text{F}$) for a minimum of 24 hr. before testing.
- 5.7 Place the specimens in the temperature chamber or oven for at least 1 hr. to ensure a consistent temperature of $77 \pm 2^\circ\text{F}$ ($25 \pm 1^\circ\text{C}$) throughout the specimen before testing.
- 5.8 Test laboratory-molded specimens within three days of molding.
- 5.9 Place one test specimen in the Los Angeles Abrasion testing machine.
Note 8—Do not include the steel balls.
- 5.10 Rotate the Los Angeles Abrasion machine at a speed of 30–33 rpm for 300 revolutions.
- 5.11 After 300 revolutions, discard the loose material broken off the test specimen.
- 5.12 Without including any of the discarded material, weigh the test specimen. Record and designate this weight as B under Section 6.
- 5.13 Repeat Sections 5.9 through 5.12 for the remaining samples.
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6. CALCULATIONS

- 6.1 Calculate the Cantabro Loss using the following formula:

$$CL = \frac{A - B}{A} \times 100$$

Where:

CL = Cantabro Loss, %

A = Initial weight of test specimen

B = Final weight of test specimen

7. REPORT

7.1 Report the following for each specimen:

- initial weight,
- final weight, and
- percent loss.

7.2 Report the average percent loss of the tested specimens to the nearest 0.1%.

8. REPORT FORMS

8.1 [Cantabro](#)

9. ARCHIVED VERSIONS

9.1 Archived versions are available.