Test Procedure for

EFFECT OF WATER ON BITUMINOUS PAVING MIXTURES

TxDOT Designation: Tex-530-C

Effective Date: August 2008 - July 2026

1. SCOPE

1.1 Use this procedure to evaluate the susceptibility of hot mix-cold laid (HMCL) or hot mix-hot laid (HMHL) paving mixtures to stripping of the asphalt from the aggregate by water. Also use the procedure to evaluate the effectiveness of anti-stripping additives in a paving mixture.

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 *Mixing pan,* round, approximately 20 mm (8 in.) in diameter and 8 mm (3 in.) depth.

2.2 *Mixing trowel.*

2.3 *Mercury thermometer,* capable of measuring the temperature specified in the test procedure.

2.4 *Metal can,* e.g., small ointment tin.

2.5 *Spatula,* approximately 10-mm (4-in.) metal blade.

2.6 *Balance,* Class G2 in accordance with Tex-901-K, with minimum capacity of 2000 g.

2.7 *Oven,* capable of maintaining 150°C (300°F).

2.8 *Hot oil bath,* controllable at 177°C (350°F) and sized to allow a 2000-mL (68-oz.) beaker supported at a minimum of 0.6 mm (0.25 in.) from the bottom when submerged to 2/3 of its depth.

2.9 *Beaker,* 2000 mL (68 oz.), preferably stainless steel.

2.10 *Stirring rod,* capable of withstanding the temperature specified in the test procedure.

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3. MATERIALS

3.1 *White paper towels.*

3.2 *Distilled or deionized water.*

3.3 *USP mineral oil for bath,* minimum flash point of 215°C (420°F).

4. PROCEDURES

4.1 *Evaluating Commercial Anti-Strip Agents:*

4.1.1 Pre-heat the asphaltic material to the minimum temperature shown in Tex-205-F, Table 1.

4.1.2 Weigh an amount of asphaltic material and anti-strip agent into a metal can, to yield approximately 100 g of treated asphaltic material.

4.1.3 Immediately mix the two materials by stirring with a small spatula for a minimum of 2 min.

4.1.4 Express the concentration of anti-strip agent as a percentage of the treated asphaltic material.

4.2 *Lime or Lime Slurry:*

4.2.1 Mix the lime well with the aggregate.

4.2.2 If using a slurry, dry the lime/aggregate mixture at the temperature shown for mixing in Tex-205-F, Table 1.

4.2.3 Express the lime concentration as a percentage of the aggregate.

4.3 *Preparing and Mixing Sample:*

4.3.1 Prepare approximately 1000 g of the mix using the appropriate asphaltic material and aggregate.

4.3.2 Mix in accordance with Tex-205-F, except weigh representative samples of each project together, rather than separating them into different sizes.

4.3.3 Allow the mix to cool at room temperature for 24 ± 2 hr.

4.3.4 For HMCL mixtures that contain asphalt cement and primer, prepare an asphalt-primer blend (no water), and any additional additives in the ratio anticipated during plant production.

4.3.5 Mix this asphalt/primer blend (if required) with the aggregate, as above, except that the blend and aggregate temperature must be 93 ± 3°C (200 ± 5°F).

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4.4 *Curing (for HMCL Mixtures):*

4.4.1 Immediately after mixing, spread the mixture no more than one coarse aggregate deep in a flat pan.

4.4.2 Place in an 88 ± 3°C (190 ± 5°F) oven for 3 hr. ± 15 min., stirring the sample after 7.5 min.

4.4.3 Remove the sample from the oven and cool at room temperature for 2 hr. ± 15 min.

Note 1—If specified, the HMCL material is tested in the as-received condition. In this case, obtain and immediately test a 200 g representative sample.

4.5 *Testing:*

4.5.1 Bring the oil bath to between 163 and 177°C (325 and 350°F).

4.5.2 Obtain a 200 g representative sample of the material to be tested.

4.5.3 Fill the 2000-mL (68-oz.) beaker to approximately half capacity with distilled water and heat to boiling.

4.5.4 Add 200 g of mix to the boiling water. Distribute the mix evenly over the bottom of the beaker using a stirring rod.

4.5.5 Place the beaker in the oil bath. If the water does not return to boiling within 3 min., check the oil bath temperature and restart the test using a new sample.

4.5.6 Maintain the water at a medium boil for 10 min. ± 30 sec. and then remove from the bath.

4.5.7 Skim any asphalt from the water surface with a paper towel.

4.5.8 Decant the water from the beaker and empty the wet mix onto a white paper towel.

4.5.9 Estimate the degree of stripping present by visual examination under slight magnification.

4.5.10 Repeat Section 4.5.9 after the mixture has dried for 24 ± 2 hr.

4.5.11 Report the test results as the estimated percent of stripping after the drying period.

4.5.12 When evaluating the mixture during production, compare the production results to the results obtained from the design sample according to the specifications.

5. NOTES

5.1 Be careful not to get water in the oil bath, especially when it is hot. Observe the usual precautions when handling hot asphalt, aggregate, water, and oil.

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5.2 Test plant mixes by this procedure beginning with the cooling or curing requirements for HMHL or HMCL mixtures, respectively.

5.3 Use a Fisher Burner as an alternative to an oil bath. A ring stand with ceramic-centered iron wire gauze must support the beaker.

5.4 Use metal beakers in the oil bath. Glass beakers may crack or break in the hot oil bath, resulting in a safety hazard.

6. REPORTING

6.1 Report the test results as the estimated percent of stripping after the drying period.

7. ARCHIVED VERSIONS

7.1 Archived versions are available.

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