Test Procedure for

TESTS FOR ASPHALT AND CONCRETE JOINT SEALERS

TxDOT Designation: Tex-525-C

Effective Date: February 2005 – July 2026

1. SCOPE

1.1 This method covers the various procedures for asphalt and concrete pavement joint sealers. The tests performed will depend upon the requirements set forth for each particular material in DMS-6310.

1.2 The following procedures are included:

- Part I—Flow Test for Class 4 Joint Sealant,
- Part II—Nonvolatile Content, and
- Part III—Tensile Strength and 24-Hour Extension Test.

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.

PART I—FLOW TEST FOR CLASS 4 JOINT SEALANT

2. SCOPE

2.1 Use the following procedure to measure the susceptibility of the material to flow caused by gravity.

3. APPARATUS

3.1 *Flow jig,* as shown in Figure 1, consisting of a rectangular metal bar with a 1.5-in. diameter by 0.25-in. deep hollow, closed by pushing a plunger from the underside, bringing the bottom of the hollow flush with the surface of the bar.

3.2 *Spatula,* with 4-in. (100-mm) blade.

3.3 *Timer,* accurate to 1 sec.

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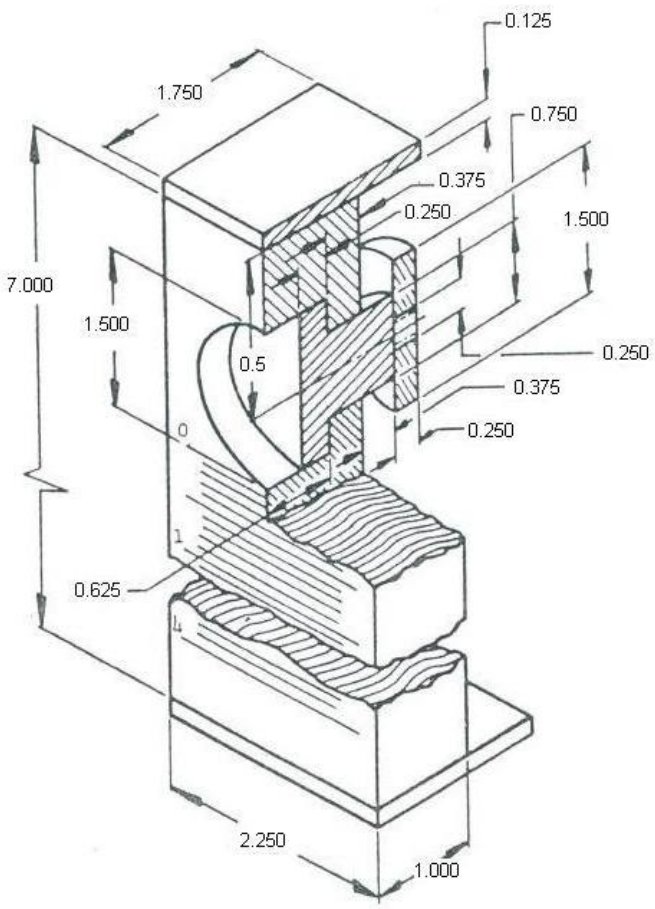

Dimensions in Inches. Tolerances ± 0.016 in.

Figure 1—Flow Jig

4. PROCEDURE

4.1 Place flow jig on table with face upward and plunger fully depressed.

4.2 Fill the cavity with sealant to overflowing.

4.3 With a spatula, strike off excess sealant flush with the face of the jig.

4.4 Within 10 sec. after leveling, place the jig on end and extend the plunger.

4.5 After 30 min., measure the distance, to the nearest 0.1 in., that the bottom of the specimen has moved, and report this as the flow.

PART II—NONVOLATILE CONTENT

5. SCOPE

5.1 Use the following procedure to measure the percentage of nonvolatile material in the sealant.

6. APPARATUS

6.1 *Flat bottom dish,* metal or other suitable material, nominally 2.75 in. (70 mm) in diameter and 0.7 in. (17 mm) high.

6.2 *Forced draft oven,* maintained at 158 ± 2°F (70 ± 1°C).

6.3 *Desiccator.*

6.4 *Balance,* Class B in accordance with Tex-901-K.

6.5 *Spatula,* with 4-in. (100-mm) blade.

7. PROCEDURE

7.1 Place 10 ± 0.5 g of the sealant in the flat bottom dish, recording the weight of the sample to the nearest 0.001 g.

7.2 Immediately weigh the dish and sample to the nearest 0.001 g.

7.3 Place the dish in the forced draft oven maintained at 158 ± 2°F (70 ± 1.0°C) for 168 ± 2 hr.

7.4 Remove the dish from the oven.

7.5 Place the dish in desiccator for 30 min.

7.6 Remove the dish from the desiccator.

7.7 Weigh the dish and sample to the nearest 0.001 g.

7.8 Calculate the percent nonvolatile content as shown under Section 8.

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8. CALCULATIONS

8.1 Calculate the percent nonvolatile content:

$$X = 100 - \frac{(w_i - w_f)}{w_s} \times 100$$

Where:
X = nonvolatile content expressed as a percentage
w_i = initial weight of the dish and sample (from Section 7.2)
w_f = final weight of the dish and sample (from Section 7.7)
w_s = sample weight (from Section 7.1).

PART III—TENSILE STRENGTH AND 24-HOUR EXTENSION TEST

9. SCOPE

9.1 Use the following procedure to determine the tensile strength and tenacity of the material under prolonged deformation.

10. APPARATUS

10.1 *Extension machine,* as described in ASTM D 5329.

10.2 *Environmental cabinet,* capable of maintaining -20 ± 2°F (-29 ± 1°C) and chamber capacity to accommodate specimen extension portion of the extension machine.

10.3 *Water bath,* capable of maintaining 77 ± 1°F (25 ± 0.5°C).

10.4 *Forced draft oven,* capable of maintaining 158 ± 2°F (70 ± 1°C).

10.5 *Mortar blocks,* 3 × 2 × 1 in. (76 × 51 × 25 mm), as described in ASTM C 719.

10.6 *Steel blocks,* 3 × 2 × 0.25 in. (76 × 51 × 6 mm).

10.7 *Mold spacer blocks,* suitable for a 2-in. long × 0.5-in. wide × 0.5-in. thick (50.8-mm long × 12.7-mm wide × 12.7-mm thick) specimen.

10.8 *Release agent.*

10.9 *Rubber bands.*

10.10 *Spatula,* with 4-in. (100-mm) blade.

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11. PREPARING TEST SPECIMEN

11.1 Prepare five specimens for bond testing as described in ASTM C 719, Section 7, noting the following details.

11.1.1 The specimen must be 0.5-in. (12.7-mm) thick.

11.1.2 If the sealant is used with armor joints, use steel blocks instead of mortar blocks, and use a primer if the manufacturer recommends it.

11.1.3 If the sealant is used with other than concrete, asphalt, or armor joints, use sample blocks made of the appropriate material.

11.2 Cure all the specimens at 75 ± 5°F (24 ± 3°C) and 55 ± 5% relative humidity for the initial cure time (± 2 hr.) listed in DMS-6310 for the class of sealant being tested.

11.3 Place one specimen in the water bath maintained at 77 ± 1°F (25 ± 0.5°C).

11.4 Place one specimen in the oven maintained at 158 ± 2°F (70 ± 1°C).

11.5 Maintain the remaining three specimens at 75 ± 5°F (24 ± 3°C) and 55 ± 5% relative humidity.

11.6 Cure all the specimens at their respective conditions for 96 ± 2 hr.

11.7 At the end of the curing period, perform the following activities.

11.7.1 Test one of the air-cured specimens as described under Section 12.2.

11.7.2 Perform nonimmersed, three-cycle bond testing at -20°F (-29°C) and 50% extension, as described in ASTM D 5329, Sections 9.4 to 9.7, on the remaining two air-cured specimens.

11.7.3 Condition the water and oven-cured specimens in air for 2–24 hr. at room temperature.

11.8 Test the water and oven-cured specimens as described under Section 12.2.

11.9 Condition any of the remaining specimens that have passed the bond test for 2–24 hr. at room temperature.

11.10 Test the conditioned specimens as described under Section 12.2.

12. TENSILE STRENGTH AND EXTENSION TESTS

12.1 *Apparatus:*

12.1.1 *Tensile machine,* capable of head movement at a uniform rate of approximately 0.5 in. (13 mm) per min.

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12.1.2 *Spacer blocks,* of any suitable material, 2.5 × 1.25 × 0.5 in. (63 × 32 × 13 mm).

12.2 *Procedure:*

12.2.1 Subject each specimen to tensile loading at an extension rate of 0.5 ± 0.1 in. (13 ± 2.5 mm) per min. until the joint has been extended 150% (joint spacing of 1.25 in. [31.8 mm]).

12.2.2 Record the load at 150% extension and report this as the tensile stress.

12.2.3 Maintain the 150% extension for 24 hr. using spacer blocks.

12.2.4 After 24 hr., examine the specimen for adhesive or cohesive failure of the extended material and report the result as either "pass" or "fail."

13. ARCHIVED VERSIONS

13.1 Archived versions are available.

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