Test Procedure for

RESILIENCE TEST FOR SEALANTS AND REPAIR MATERIALS

TxDOT Designation: Tex-547-C

Effective Date: December 2011

1. SCOPE

1.1 Use the following procedure to measure the resilience of joint sealants, crack sealants, or concrete repair materials after compression.

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 *Load frame,* or hydraulic press, capable of maintaining a cross head speed of 2 ± 0.1 in./min. (50 ± 2.5 mm/min.) under maximum load, with a minimum travel distance of 1 in. (25 mm).

2.2 *Press base and head,* steel, circular or square, with attachment points suitable to the load frame or hydraulic press used for the test.

- Circular—6 in. minimum diameter, 1 in. minimum thickness
- Square—6 in. minimum width and height, 1 in. minimum thickness

2.3 *Pipe,* steel, 2.625 ± 0.04 in. (66 ± 1 mm) inside diameter.

2.4 *Plate,* steel, aluminum, or brass, minimum height of 4 in. (100 mm), minimum width of 4 in. (100 mm), minimum thickness of 0.125 in. (3 mm).

2.5 *Spacers,* two each steel, aluminum, or brass; height 0.5 ± 0.04 in. (12.5 ± 1 mm), width 0.5 ± 0.04 in. (12.5 ± 1 mm), length not more than 2.5 in. (68 mm).

2.6 *Calipers,* accurate to ± 0.01 in. (± 0.25 mm).

2.7 *Laboratory gas burner,* Fisher style.

2.8 *Spatula,* steel, 4-in. (100-mm) minimum blade width.

2.9 *Release agent,* silicone grease, glycerin/talc mixture, or other suitable non-petroleum material.

Note 1—A silicone baking sheet, cut to fit the height and width dimensions of the metal plate specified in Section 2.4, may be used in place of release agent on the metal plate.

2.10 *Wax paper.*

2.11 *Rubber bands,* of sufficient size and strength to hold the mold halves securely together.

3. MOLD PREPARATION

3.1 Cut the pipe to a length of 1 ± 0.04 in. (25 ± 1 mm). Cut the resulting ring of pipe lengthwise into two equal halves. (See Figure 1.) File the edges of the pipe to eliminate any sharp burrs.

3.2 Coat the metal plate and the inside of the pipe halves with release agent. Reassemble the halves of the mold on the plate, using rubber bands to hold the halves together.

Note 2—If using a silicone baking sheet, there is no need to use release agent on the metal plate.

3.3 Other molding methods may be used, provided that the resulting specimen has the same dimensions: 1 ± 0.04 in. (25 ± 1 mm) height, and approximately round with a maximum diameter of 2.625 ± 0.04 in. (66 ± 1 mm).

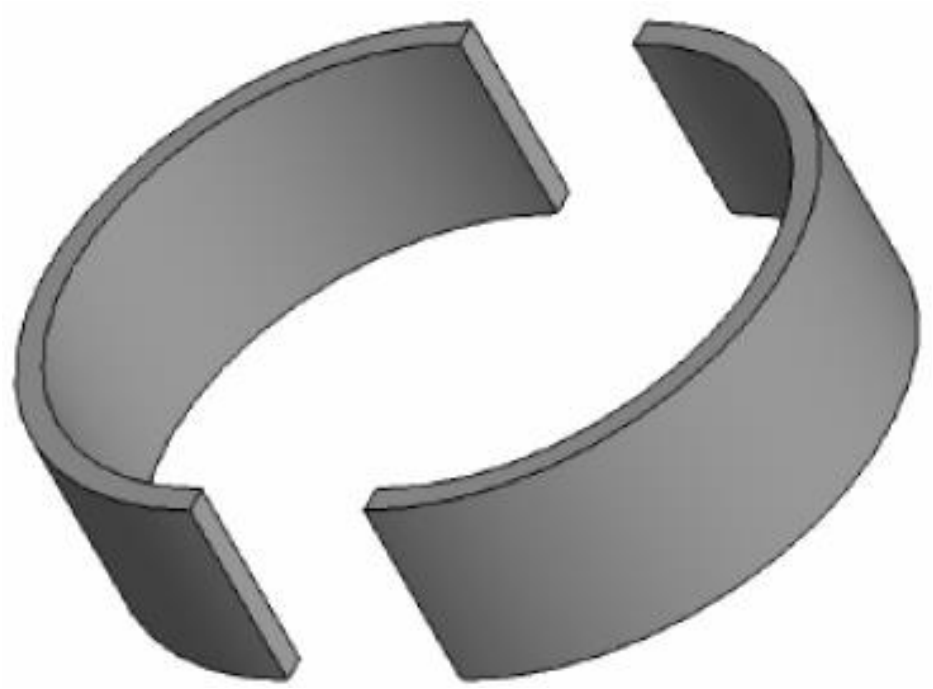

Figure 1—Compression Mold

4. PROCEDURE

4.1 Obtain and prepare a representative sample of material for testing in accordance with Tex-546-C.

4.2 Pour the material into the prepared mold.

4.3 Trim the material flush with the top of the mold using the metal spatula, heated on the burner.

4.4 Allow the material in the mold to cool to room temperature for a minimum of 12 hr.

4.5 Remove the rubber bands from the mold. Remove the mold by pulling the mold halves from each side of the specimen, being careful not to distort the material.

4.6 Make two measurements of the diameter of the material, 90 degrees apart, with the calipers. Record the average of these two measurements to the nearest 0.1 in. (2.5 mm) as the starting diameter.

4.7 Place a sheet of wax paper on the press base in the press or load frame. Place the material sample on the wax paper, at the center of the press base. Place the spacer blocks at the edges of the press base, 180 degrees apart. Place a sheet of wax paper on top of the sample. Slowly lower the press head until it contacts the sample. Continue to lower the press head slowly, compressing the material, until the press head just contacts the spacers.

4.8 Immediately (without releasing the compression head) make two measurements of the compressed diameter of the material, 90 degrees apart. Record the average of these two measurements to the nearest 0.1 in. (2.5 mm) as the compressed diameter.

4.9 Raise the press head and remove the material, using care to avoid distortion. Allow the material to recover at room temperature for 24 hr.

4.10 Make two measurements of the recovered diameter of the material, 90 degrees apart, with the calipers. Record the average of these two measurements to the nearest 0.1 in. (2.5 mm) as the final diameter.

4.11 Calculate the resilience to the nearest 1% as described in Section 5 and report.

5. CALCULATIONS

5.1 Calculate resilience:

$$\frac{(C-F)}{(C-S)} \times 100 = \mathrm{R}$$

Where:

S = Starting diameter, in.

C = Compressed diameter, in.

F = Final diameter, in.

R = Resilience, %.