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**Test Procedure for****AGGREGATE RETENTION TEST****TxDOT Designation: Tex-216-F****Effective Dates: August 1999–September 2014.**

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**1. SCOPE**

- 1.1 This method provides a procedure to determine the adherent quality of aggregate for surface treatment. Express the aggregate retention factor as the percent of aggregate by weight that remains in place when the minimum application of asphalt and maximum coverage of stone allowed by a surface treatment specification are applied to a test panel.
- 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.
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**2. APPARATUS**

- 2.1 *Galvanized metal tray.*
- 2.2 *Solid metal cylindrical roller, weighing approximately 20 kg (45 lb.)*
- 2.3 *Hot plate.*
- 2.4 *Electric oven, capable of maintaining a temperature of 60–110°C (140–230°F).*
- 2.5 *Plywood, 19 mm (0.75 in.), cut to a 75° bevel on one edge.*
- 2.6 *Miscellaneous items, including a brush, small scoop, small can, pliers, and asbestos gloves.*
- 2.7 *Balance, class G2 in accordance with Tex-901-K.*
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**3. MATERIALS**

- 3.1 *Asphalt material, to be tested.*
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**4. PREPARING MATERIALS FOR TEST**

- 4.1 Obtain a representative sample of cover stone for the surface treatment. Determine the unit weight in  $\text{kg/m}^3$  ( $\text{lb./ft.}^3$ ).
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- 4.2 Place a quantity of the asphalt cement into a small can to facilitate handling.
- 4.3 Heat asphalt to the anticipated field application temperature.
- 4.3.1 Do not overheat material.
- 4.3.2 For cutback asphalt, the maximum temperature is 60°C (140°F).
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## 5. PROCEDURE

- 5.1 Tare the rectangular metal tray.
- 5.2 Weigh into the tray the amount of heated asphalt equal to the desired rate of application. (See Section 6.)
- 5.3 Remove the tray from the balance and warm over a hot plate, tilting the tray from side to side, causing the asphalt to flow evenly over the entire area of panel.
- 5.4 Place asphalt-coated tray on a level surface in an oven and heat at a temperature sufficient to achieve the anticipated field application temperature, for approximately 1 hr.
- 5.5 Weigh into a pan an amount of aggregate equal to the desired rate of coverage required by specifications. Record this weight as  $W_1$  under Section 6.
- 5.6 Remove the asphalt tray from the oven and immediately spread the aggregate on the asphalt, taking precaution to obtain uniform distribution.
- 5.7 Use the heavy metallic cylinder to roll the surface, making one pass of the roller over the entire surface in a longitudinal direction.
- 5.8 Allow the sample to cool to room temperature.
- 5.9 Tilt the test panel at an angle of 75°, with the horizontal catching all loose aggregate that rolls off. Lightly brush surface to remove all particles not stuck to the asphalt film.
- 5.10 Weigh the total amount of displaced aggregate and record the weight as  $W_2$  under Section 6.
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## 6. CALCULATIONS

- 6.1 Aggregate Retention Factor:

$$\text{Percentage Aggregate Retention} = 100 - \frac{(W_2 \times 100)}{W_1}$$

Where:

$W_1$  = weight of aggregate, g

$W_2$  = weight of aggregate displaced, g.

6.2 Weight of Asphalt in grams to cover the test panel:

6.2.1 *SI Units:*

$$\text{Application of asphalt} = \frac{L \times W \times B \times C}{10} = D \text{ in grams}$$

Where:

L = length of test panel, mm

W = width of test panel, mm

B = application rate of asphalt from specifications, L/m<sup>2</sup>

C = specific gravity of asphalt.

6.2.2 *English Units:*

$$\text{Application of asphalt} = 2.917LWCB = D \text{ in ounces}$$

Where:

L = length of test panel, in.

W = width of test panel, in.

B = application rate of asphalt from specifications, gal./yd.<sup>2</sup>

C = specific gravity of asphalt.

6.3 Weight of Cover Stone in grams to cover the test panel:

6.3.1 *SI Units:*

$$\text{Amount of aggregate} = \frac{L \times W \times E \times F}{10} = G \text{ in grams}$$

Where:

L = length of test panel, mm

W = width of test panel, mm

E = loose unit weight of aggregate, kg/m<sup>3</sup>

F = application rate for aggregate from specification, m<sup>3</sup>/m<sup>2</sup>.

6.3.2 *English Units:*

*Amount of aggregate = 9.458LWEF = G in ounces*

Where:

L = length of test panel, in.

W = width of test panel, in.

E = loose unit weight of aggregate, pcf

F = application rate for aggregate from specification in yd.<sup>3</sup>/yd.<sup>2</sup>.

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