

**State of Nevada  
Department of Transportation  
Materials Division**

**METHOD OF TEST FOR FILM STRIPPING**

**SCOPE**

The film stripping test is used to measure the resistance of bituminous mixtures to stripping of the asphalt from the rock particles and is generally used to evaluate the mineral aggregate but may be used to judge the adhesive capacity of the bituminous material. Stone screenings for use in chip seals are usually subjected to this test. The test is applied to the aggregate fraction passing the 3/8 in. (9.5 mm) sieve and retained on the No. 8 (2.36 mm) sieve.

**A. APPARATUS**

1. Glass Jars, 8 oz (236.6 mL) screw cap, with an approximate diameter of 2 1/8 in. and depth of 5 3/8 in.
2. Testing machine suitable for holding test jars and rotating at approximately 30 rpm.
3. Oven, thermostatically controlled, capable of maintaining temperatures up to 230°F (110°C) with forced air circulation.
4. Metal containers, 6 oz. covered cylindrical seamless with lid, with an approximate diameter of 2 3/4 in. and depth of 1 7/8 in.
5. Balance, 11 kg capacity, accurate to  $\pm 0.1$  g.
6. Sieves, U.S. Standard, sizes 3/8 in. (9.5 mm), Nos. 4 (4.75 mm) and 8 (2.36 mm).
7. Small metal scoop.
8. Stopwatch / timer.

**B. PREPARATION OF AGGREGATE**

Process the aggregate in a manner comparable to construction processing, i.e., wash if washing is to be employed; otherwise, test as received. Perform film stripping testing on the portions of aggregate minus 3/8 in (9.5 mm) x plus No. 4 (4.75 mm) and plus No. 4 (4.75 mm) x plus No. 8 (2.36 mm). Combine 30 g of each aggregate size and place in 6 oz. metal container. All aggregate shall be dried to a constant

weight at  $230 \pm 9^{\circ}\text{F}$  ( $110 \pm 5^{\circ}\text{C}$ ) prior to proportioning and combining.

### C. MIXING

1. Coat 60 g of aggregate with the type of asphalt to be used in construction. The amount of asphalt will vary from approximately 4 percent to 8 percent (by weight of dry aggregate) depending on absorptive and surface characteristics of the aggregate.

#### Mixing Temperatures:

- a. Emulsified asphalts with viscosity tested at  $77^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ ) shall be mixed at room temperature,  $77 \pm 9^{\circ}\text{F}$  ( $25 \pm 5^{\circ}\text{C}$ ).
  - b. Emulsified asphalts with viscosity tested at  $122^{\circ}\text{F}$  ( $50^{\circ}\text{C}$ ) shall be mixed  $140 \pm 5^{\circ}\text{F}$  ( $60 \pm 3^{\circ}\text{C}$ ).
  - c. Liquid asphalts shall be mixed at  $140 \pm 5^{\circ}\text{F}$  ( $60 \pm 3^{\circ}\text{C}$ ).
  - d. All aggregates shall be at room temperature,  $77 \pm 9^{\circ}\text{F}$  ( $25 \pm 5^{\circ}\text{C}$ ) for mixing.
2. When emulsified asphalt is used as the bitumen, thoroughly dampen aggregate with water before applying the emulsion. After the emulsion has been added (10 g is usually enough), stir thoroughly, allow to stand for 1 or 2 min., restir, and drain off excess.

If during mixing, the emulsified asphalt and aggregate will not mix (aggregate repels asphalt), the two materials are not compatible, resulting in an "Unsatisfactory" result, proceed to section F. Reporting of Results.

3. Cure aggregate / asphalt mixture in an oven for  $15 \pm 3$  hours at  $140 \pm 5^{\circ}\text{F}$  ( $60 \pm 3^{\circ}\text{C}$ ).

### D. TESTS

1. After the 15 hour curing period, place 50 g of the aggregate / asphalt mixture in an 8 oz. (236.6 mL) glass jar. Any test sample that shows evidence of drainage or thinness of asphalt film should be lightly remixed before placing in glass jar.
2. Allow mixture to cool to room temperature  $77 \pm 9^{\circ}\text{F}$  ( $25 \pm 5^{\circ}\text{C}$ ), then add 175 mL of potable water at the same temperature.
3. Place jar containing sample and water in testing apparatus and rotate for 15 minutes.
4. Remove jar from the testing apparatus (pour off water, if necessary due to cloudiness), and determine by visual observation if any asphalt has stripped from the aggregate.

## **E. PRECAUTIONS**

1. Thorough mixing to coat all particles with bitumen is essential for consistent results.
2. Maintain test temperature within the limits specified.

## **F. REPORTING OF RESULTS**

Report as "Satisfactory" for aggregate / asphalt mixtures with less than 10 percent stripping of asphalt from aggregate. This indicates the material is resistant to stripping action and acceptable for use.

Report as "Unsatisfactory" for aggregate / asphalt mixtures with more than 10 percent stripping of asphalt from aggregate. This indicates the material is not resistant to stripping action and is unacceptable for use.