

Section 945

DYNAMIC STRIPPING TEST OF ASPHALT MATERIAL AGGREGATE MIXTURES

945.01 Scope

This method covers an agitation test for measuring the retention of a bituminous film by an aggregate in the presence of water. This method shall be confined to Central and Region/District Laboratories.

945.02 Apparatus:

1. Metal cans - Disposable metal cans of 20 ounce capacity such as #303 commercial cans, and 2 quart cans with lids.
2. Balance - A balance with a capacity of 500 g and sensitive to 0.1 g.
3. Spatulas - Two steel spatulas with stiff blades, one approximately 1 inch in width and 4 inches in length, the other approximately 2.5 inches in width and 4 inches in length.
4. Screen - No. 10 sieve size, 6 inches square, to hold samples.
5. Two wooden strips, ½ inch wide, ½ inch thick, and 4 inches in length to support the screen.
6. Hard, nonabsorbent paper to receive drained asphalt material.
7. Soft-textured, absorbent paper, #202 filter paper or equivalent, to dry aggregate.
8. Containers - Glass or polystyrene containers of 17 ounces capacity, such as jars or beakers.
9. Drying Oven - A thermostatically-controlled oven capable of maintaining a temperature of 230 ± 41 °F.
10. Paint shaker - Red Devil paint shaker, Model #30, or equivalent.

945.03 Materials

1. Aggregate - The aggregate used shall be unwashed and oven-dried to constant weight at a temperature of 230 ± 41 °F. The aggregate shall pass a 3/4 inch sieve and be retained on the No. 4 sieve.
2. Asphalt Material - The bituminous material shall be that proposed for use on the project. If no type of asphalt material has as yet been designated for use, stripping tests shall be performed with PG58-22 asphalt binder.

3. Water - The distilled or tap water used in conducting the stripping test shall have a ph of 6.0 to 8.0. No electrolytes of any kind shall be added to the water to obtain the required ph.
4. Hydrated lime, 1%.

945.04 Test Procedure

For each determination, one stripping test shall be performed. The asphalt shall contain no anti-stripping agent. Each test shall be performed as follows:

1. Place 150 g of the representative aggregate sample in a disposable metal can. Add 50 g of asphalt binder or cut-back asphalt, which shall have been preheated to a temperature at which it will pour easily. *PRECAUTION: If using asphalt emulsion, dampen the aggregate to a moisture content between 1 to 2 % and add 75 g of emulsified asphalt heated to 140_ 5_ F.*
2. Mix the asphalt material and aggregate with the narrow, stiff spatula until all aggregate particles are completely coated. The asphalt binder or cut-back asphalt-aggregate mixture may be heated in the oven to facilitate mixing. The temperature shall be approximately 125 °F for cut-back asphalt and 200 °F for asphalt cement. Do not heat emulsion-aggregate mixtures.
3. Place the sample on the elevated screen, and allow the excess asphalt material to drain off. Permit the sample to cure at room temperature (70 to 84 °F) for 24 hours. *PRECAUTION: Cure emulsion-aggregate mixtures for 48 hours.*
4. After curing, scrape the sample off the screen with the wide, stiff unheated spatula, and place it in a glass or polystyrene container. Immerse the sample in water, and allow it to stand at room temperature for 24 hours.
5. Remove the sample from the glass container, being careful not to disturb the bond between the asphalt material and the aggregate, and place it in the 2 quart can. For those samples that cannot be easily removed from the glass containers the following procedure shall be used:
 - (a) Invert the glass container with the sample.
 - (b) Allow a stream of warm water to run over the container until the sample is loosened from the glass.
6. Fill the 2 quart can, containing the sample, completely with tap or distilled water, and seal it with the lid. Place the can on the paint shaker, and allow it to be agitated for 10 minutes. After this time, remove the can from the paint shaker. Let the water drain off, and decant the loose asphalt material from the sample.

945.05 Addition of Lime to Aggregate:

The addition of hydrated lime may improve the stripping characteristics of some aggregates. The procedure shall be as follows:

1. Add one part of lime (by weight) to two parts of water (by weight), and mix thoroughly.
2. Add this mixture to the dry aggregate in the amount of 1% lime (by weight), and mix thoroughly. Allow the aggregate to cure in an open can for 24 hours.
3. After the curing period, test the aggregate as outlined in subsection 945.04, except anti-stripping agent.

945.06 Evaluation

Visually inspect the amount of stripped aggregate as passing at zero to ten percent.

945.07 Precaution:

Be sure the 2 quart can is filled completely with water and the lid is securely in place, before placing the can on the paint shaker. When filling the 2 quart can do not spray water directly on the mix.