METHODS OF SAMPLING AND TESTING
MT 322-04
METHOD OF DETERMINING THE PERCENT OF ADHESION OF BITUMINOUS MATERIALS TO AGGREGATE
(*Montana Method*)

1 Scope

1.1 This test is intended to evaluate the resistance of a bituminized mixture to its bituminous film removal by water.

2 Apparatus

2.1 *Drying oven* - capable of maintaining a temperature of 248º F (120º C).

2.2 Electric hot plate

2.3 Various mixing pans

2.4 Putty knife

2.5 *Balance* - with a capacity of 500 grams

2.6 ¼" wire screen

2.7 ½ gallon can

2.8 Water

2.9 “Red Devil" or equal paint shaker

3 Preparation of Sample

3.1 The proposed aggregate is mixed with bituminous materials, which may be Asphalt Cement or Liquid Asphalt, or Emulsified Asphalt. The preparation of the sample, depending upon the type of bituminous materials, is as follows:

3.2 Asphalt Cement or Liquid Asphalt

3.2.1 Approximately 150 grams of plus ¼" aggregate and a sufficient quantity of the appropriate bituminous material are heated in separate containers in an oven at 248 ºF (120 ºC).

3.2.2 After heating, the aggregate is mixed on a hot plate with just enough bituminous material to thoroughly coat the aggregate surfaces. Avoid overheating the mix, as evidenced by smoking asphalt. A metal pan and putty knife are used to accomplish the mixing. The mixture is oven cured at 250 ºF (121 ºC) for one hour, then stirred and left to cool at room temperature.

3.3 Emulsified Asphalt

3.3.1 The test procedure varies somewhat at the preliminary stage when an emulsified asphalt is used. Add a sufficient quantity of the appropriate emulsion to approximately 150 grams of dry, cool, plus ¼" aggregate and stir until the sample is completely covered. Excess emulsion is drained off on an elevated 4 Mesh wire screen. The mixture is oven cured at 250 ºF (121 ºC) for a period of one hour. If CRS-2 is used, the aggregate must be pre-wetted.

4 Procedure

4.1 After the aggregate-bituminous mixture has cooled or cured for the prescribed time, it is removed from the mixing pan or draining screen with a putty knife.

Note – In order to facilitate removal, the mixture may be removed from the mixing pan or draining screen after the receptacle has been heated on a hot plate for approximately three seconds.

4.2 The mixture is then immersed in a half-gallon can containing one quart of water at 49 to 73 ºF (15 to 25 ºC) for twenty-four hours.

4.3 At the end of the soaking period, the mixture is shaken in a "Red Devil" or other approved paint shaker for five minutes, after which it is carefully washed to remove any loose bituminous material, and placed on a doubled layer of paper toweling. The sample is spread evenly over an area approximately five inches in diameter so that the paper is not visible through the sample.

5 Evaluation

5.1 Evaluation of adhesion is made only after the aggregate is thoroughly dry. A visual estimate of the proportion of the surfaces remaining coated with bituminous material is made and the results expressed as percent adhesion.