



WSDOT Test Method T 726

Mixing Procedure for Hot Mix Asphalt (HMA)

1. Scope

This is the mixing procedure for laboratory prepared samples of asphalt concrete, asphalt treated base, or open graded asphalt products mixtures. The aggregates used in this procedure are prepared by means of WSDOT Test Method No. 724.

2. Equipment

- a. Mixing Spoon – A large metal spoon capable of handling hot mix asphalt.
- b. Scoop – A metal scoop of ample size, capable of handling hot mix asphalt.
- c. Curing Pan – A heat resistant pan of ample size to handle samples of hot mix asphalt.
- d. Mixing Bowl – A heat resistant bowl for hand mixing or mechanical mixer of ample size to handle samples of hot mix asphalt.
- e. Mechanical Mixer – A mechanical mixer with heat source may be used in lieu of hand mixing.
- f. Balance – The balance shall have capacity of 11 kg and sensitive to 0.1 gm.
- g. Oven – An oven of appropriate size, capable of maintaining a uniform temperature within the allowable tolerance for the grade of asphalt binder.
- h. Thermometer- Armored glass or dial-type thermometric devices with metal stems or probe for determining the temperature of aggregates, binder, and HMA between 180 and 418 ° F (100 and 232 ° C).

3. Procedure

- a. Heat asphalt binder, aggregate sample(s), and mixing bowl(s) in a preheated oven to the mixing temperature specified by the supplier of asphalt binder or as indicated on mix design report.
- b. Stir the asphalt binder and verify that the temperature of asphalt binder is within the temperature recommended by the asphalt supplier or as indicated on mix design verification report.
- c. After the materials are heated place mixing bowl on balance and tare.
- d. Place heated aggregate sample in the tared mixing bowl and determine the mass of the aggregate sample. Use this mass to calculate the mass of asphalt binder required to produce a sample of HMA at the Job Mix Formula (JMF) asphalt binder content (See calculation below).
- e. Form a crater in the aggregate sample and weigh in asphalt binder as determined above.

Note: If mixing bowl is not buttered an additional sample should be prepared, mixed and then discarded to properly coat the mixing bowl with asphalt and fines.

- f. Mix aggregate sample and asphalt binder for approximately 3 minutes or until aggregate sample is completely coated with asphalt binder. This can be accomplished by hand mixing or by mechanical mixer.

Note: Reheating of the HMA for a short period of time may be necessary to assure complete coating of the aggregate.

- g. Transfer mixed HMA to the proper container for other testing as required.
h. Repeat steps A thru H for each sample to be mixed.

Calculation for Mass of Asphalt Binder:

$$\text{Designated Mass of Asphalt Binder} = \frac{(A) D}{(1 - A)}$$

Where:

A = Designated asphalt binder content (expressed in decimal)

D = Dry aggregate mass (from step 3(c))

Example:

The designated asphalt binder content is 5.3%, and dry aggregate mass is 1567.1 grams.

$$\text{Designated Mass of Asphalt Binder} = \frac{(0.053) 1567.1}{(1 - 0.053)} = \frac{83.1}{0.947} = 87.7\text{g}$$

