
**METHOD OF TEST FOR COMPACTED DENSITY OF
HOT MIX ASPHALT (HMA) (DISPLACEMENT METHOD)
General Re-Write**

SCOPE

This IM provides the method of test used in determining the bulk specific gravity (G_{mb}), bulk density, of laboratory-compacted specimens of HMA or cores taken from compacted HMA pavements.

APPARATUS

- A balance having a capacity of 5000 grams or more and accurate to 0.5 gram.
- Water container of sufficient size to allow a submerged sample to not touch the sides or bottom.
- Suspension apparatus (sample holder) – “wire suspending the container shall be the smallest practical size to minimize any possible effects of a variable immersed length. The suspension apparatus shall be constructed to enable the container to be immersed to a depth sufficient to cover it and the test sample during weighing. Care should be taken to ensure no trapped air bubbles exist under the specimen” (AASHTO T166-00).
- Spatula or putty knife
- Clean cloth



Balance, Sample Holder, and Water Container

PROCEDURE

SAMPLE PREPARATION

Field Cores

1. Allow the core to attain laboratory room temperature prior to testing. Cores stored in refrigerated units must be removed and allowed to stand at least 2 hours at room temperature prior to testing. Under no circumstances shall the cores be submerged in water prior to testing.
2. Clean off all loose particles, base materials, and prime oils that are stuck to the sample. The portion of the sample that needs to be cleaned may be lightly warmed and scraped with a putty knife.
3. If water was used in cutting the sample, the specimen shall be surface-dried before testing.

Laboratory Compacted Specimens

1. Cool lab-compacted specimens to laboratory room temperature before testing.
2. Clean off all loose particles that are stuck to the specimen.

TEST PROCEDURE FOR DENSITY

1. Fill the water container with water at approximately 77°F (25°C) to a depth sufficient to ensure that the sample holder and sample are completely submerged during testing.
2. Connect the wire to the balance at the point provided on the balance.
3. Connect the holder to the wire and place in the water bath filled with water and tare the balance.
4. Weigh the sample in air (W_1).
5. Weigh the suspended sample completely submerged in water targeted at 77° ± 5°F (25° ± 3°C) (W_2). The reading must be taken when the balance stabilizes.

Note: The balance will normally be considered to have stabilized when the weight reading doesn't change by more than 0.1 gram over a 10 to 30 second time span.

6. Remove the sample from the water, and with a damp cloth; blot the free water from the surface of the sample. Weigh the sample again in air (W_3).

Note: Care should be taken not to rub any particles from the edges or corners when blotting the free water.

7. Calculate the G_{mb} bulk density, and report the result to three decimal places.

CALCULATIONS

The calculation for determining G_{mb} is as follows:

$$G_{mb} = \frac{W_1}{W_3 - W_2}$$