
HDOT TM 7-00

Standard Test Method for Relative Density of Asphalt Concrete Pavement by Cores

1. Scope

1.1 This test method covers the determination of percent relative density of a lot of asphalt concrete pavement by comparing the core specific gravity and theoretical maximum specific gravity of bituminous mixes.

2. Referenced Documents

AASHTO Standards:

- R11 Using Significant Digits in Test Data to Determine Conformance with Specifications
- T166 Bulk Specific Gravity Of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
- T209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- T275 Bulk Specific Gravity Of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens

3. Definition

3.1 Lot - The quantity of asphalt concrete pavement of a specific mix type, material, and thickness that is compacted in the same manner on a production day.

4. Procedure

4.1 Samples - The rate of sampling shall be in accordance with the "Sampling and Testing Guide".

4.2 Rounding off - The method to be used is AASHTO R11.

4.3 Cores - The samples cored from the compacted pavement representing the lot for a production day.

4.3.1 The specific gravity of core specimens shall be determined in accordance with AASHTO T166 or T275.

4.3.2 The specific gravity of the pavement lot shall be the average specific gravity of the core specimens. In determining the average specific gravity, the calculated value for each core shall be carried to four (4) significant figures (three decimal places, 0.001) and the average value rounded off to the nearest hundredth (two decimal places, 0.01).

4.4 Uncompacted Mixture

4.4.1 The theoretical maximum specific gravity shall be determined in accordance with AASHTO T209.

4.4.2 If two (2) or more samples of uncompacted mixture are used, the theoretical maximum specific gravity shall be the average of all. In determining the average theoretical maximum specific gravity, the calculated value for each sample shall be carried to four significant figures (three decimal places, 0.001), and the average value rounded off to the nearest hundredth (two decimal places, 0.01).

5. Calculation and Report

5.1 The percent relative density for a production day shall be calculated by dividing the average specific gravity of the pavement lot (cores) by the average theoretical maximum specific gravity of the uncompacted mixture, multiplied by 100.

5.1.1 Calculate the percent relative density as follows:

$$\text{Percent Relative Density} = \frac{\text{Average Core Specific Gravity}}{\text{Ave. Theoretical Maximum Specific Gravity}} \times 100$$

5.2 The percent relative density shall be reported to the nearest percent (1%).