

MT 312-14
DETERMINING MOISTURE CONTENT
OF BITUMINOUS MIXTURES
(Modified AASHTO T 329)

1 Scope

- 1.1 This test method covers the determination of the moisture content of bituminous mixtures by drying in an oven.

2 Referenced Documents**AASHTO**

T 329 Moisture Content of Hot Mix Asphalt (HMA) by Oven Method

MT Materials Manual

MT 303 Sampling Bituminous Paving Mixtures

MT 309 Splitting Samples of Plant Mix Surfacing to Testing Size

3 Terminology

- 3.1 *Constant mass* – the state at which a mass does not change more than 0.05 percent.
- 3.1.2 Determine the mass after initially dried for 90 ± 5 minutes. Continue drying the sample at 30 ± 5 minute intervals, at a temperature not to exceed mix design compaction temperature range. After each interval, determine the mass and use the calculation in Section 7.2 until the sample has achieved constant mass.

4 Apparatus

Ensure equipment used meets the following requirements:

- 4.1 *Forced Air, Ventilated, or Convection Oven* – capable of maintaining mix design compaction temperature range.
- 4.2 *Thermometer* – with a temperature range from 50°F to 400°F (10°C to 204.4°C).
- 4.3 *Balance or scale* – with a capacity of at least 2 Kg., readable to 0.1 gram.
- 4.4 *Sample container* – not affected by heat and of sufficient size to contain a test sample of at least 1,000 g without danger of spilling.

5 Sample

- 5.1 Obtain the test sample in accordance with [MT 303](#), and reduce in accordance with [MT 309](#). Ensure the test sample is at least 1000 g.

6 Procedure

- 6.1 Determine and record the temperature and mass of the sample container to the nearest 0.1 g.
- 6.2 Place the test sample in the sample container and evenly distribute. Determine and record the total mass of the sample container and the test sample to the nearest 0.1 g.
- 6.3 Calculate the initial, moist mass of the test sample by subtracting the mass of the sample container determined in section 6.1 from the total mass of the sample container and the test sample determined in section 6.2.
- 6.4 Dry the test sample to a constant mass in the sample container.

- 6.5 After drying, determine and record the total mass of the sample container and test sample to the nearest 0.1 g.

Note 1 – Do not remove the test sample from the sample container for the purposes of determining mass.

- 6.6 Ensure the final sample temperature is within $\pm 15^{\circ}\text{F}$ of the temperature recorded in Section 6.1.
- 6.7 Calculate the final, dry mass of the test sample by subtracting the mass of the sample container determined in section 6.1 from the total mass of the sample container and the test sample determined in section 6.5.

Note 2 – Moisture content and the number of samples in the oven will affect the rate of drying. Placing wet samples in the oven with nearly dry samples will affect the drying process.

7 Calculations

- 7.1 Calculate the **moisture content**, as a percentage of the total mix, using the following formula:

$$\text{Moisture Content, \%} = \left(\frac{M_i - M_f}{M_i} \right) \times 100$$

where:

M_i = mass of the initial, moist test sample

M_f = mass of the final, dry test sample

Example: $M_i = 1001.3\text{g}$

$M_f = 991.7\text{g}$

$$\text{Moisture Content, \%} = \left(\frac{1001.3 - 991.7}{1001.3} \right) \times 100 = 0.9587, \text{ round to } 0.96\%$$

- 7.2 Calculate the **change in mass**, as a percentage, using the following formula:

$$\% \text{ Change} = \left(\frac{M_p - M_n}{M_n} \right) \times 100$$

Where:

M_p = previous mass measurement

M_n = new mass measurement

8 Reporting

- 8.1 Report the moisture content to the nearest 0.01 percent.