METHODS OF SAMPLING AND TESTING
MT 304-14
MOISTURE TEST ON PLANT MIX BITUMINOUS SURFACING AGGREGATES
(*Montana Method*)

1 Scope

This test method covers the determination of the moisture content of bituminous surfacing aggregates by various drying methods.

2 Referenced Documents

AASHTO Standards
M 231 Weighing Devices Used in the Testing of Materials

MT Materials Manual
MT 201 Sampling Roadway Materials

3 Terminology

3.1 Constant mass – the state at which a mass does not change more than 0.10 percent, after additional drying for the defined time interval in Table 3.1.

Table 3.1
Methods of Drying

Heat Source	Specific Instructions	Drying increments (minutes)
Controlled: Forced draft (preferred), ventilated, or convection oven	110 ±5°C (230 ±9°F)	30
Uncontrolled: Hot plate, Heat Lamp, etc.	Stir frequently	20
Microwave	Heap sample and cover with ventilated lid	10

4 Apparatus

Ensure equipment used meets the following requirements

4.1 *Drying Apparatus* - any suitable device capable of drying samples.

4.2 *Balance* – balance or scale with a capacity larger than the size of the sample being tested. The balance or scale must have a sensitivity of 0.1 gram and conform to the requirements of AASHTO M 231.

4.3 *Sample container* – not affected by heat and of sufficient size to contain a test sample of at least 4,000 g without danger of spilling.

5 Sampling

5.1 Weigh sample containers (C).

5.2 Obtain a representative sample of at least 3 pounds from each bin, stockpile, or cold feed belt per MT 201. Immediately place the material, from each separate bin, stockpile, or cold feed belt, into a weighed container and seal.

6 Procedure

6.1 Weigh the container with the aggregate (W).

6.2 Transfer the material to drying pans and dry to constant mass in an approved manner. Stir the sample occasionally to facilitate drying.

6.3 Reweigh the sample and container when the sample has been dried to constant mass (D).

Note 1 – Perform moisture testing on mixes showing the following properties:

- *Foaming on the surface of the coarse aggregate particles*
- *Excessive slumping of the mix in the truck*
- *Condensed water dripping from the truck box*
- *Bubbles or blisters forming on the surface immediately behind the paver*

Ordinarily these conditions will not develop if the moisture content is below approximately 2 percent.

7 Calculations

7.1 Compute the moisture content of each sample of the aggregate using the following formula:

$$M = \left(\frac{W - D}{D - C}\right) \times 100$$

where:

M = percent of moisture

W = wt. of wet sample and container

D = wt. of dry sample and container

C = wt. of container

7.2 Compute the composite moisture content of the total aggregate according to the following example:

Aggregate Size	Fraction of Job Mix	Multiply	Moisture Content, Percent
3/4" to 3/8"	0.20	x	2.00 = 0.40
3/8" to No. 10	0.40	x	1.00 = 0.40
Passing No. 10	0.40	x	0.50 = 0.20
Composite Moisture Content			= 1.00

8 Reporting

8.1 Report the moisture content to the nearest 0.10 percent.