

**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)
<b>Controlled:</b> Forced draft (preferred), ventilated, or convection oven	110 ±5°C (230 ±9°F)	30
<b>Uncontrolled:</b> 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		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.