

**ATT-15/22, MOISTURE CONTENT, Oven Method
Part II, Emulsified Asphalt Mixes**

1.0 SCOPE

This method describes the procedure for determining the moisture content of emulsified asphalt mixes using a field laboratory drying oven.

2.0 EQUIPMENT

Drying oven – thermostatically controlled, capable of maintaining a uniform temperature of $130 \pm 5^\circ \text{C}$.

Electronic Balance – for measuring the mass of wet and dried samples (sensitive to 0.1 g). The balance must be operated as per manufacturer's recommendations. Balances must be inspected, cleaned, and calibrated annually.

drying pans	grocer scoop	plastic pails or plastic bags
putty knife	thermometer (calibrated)	heat-resistant gloves
large mixing pan		

Data Sheet: Moisture Content, such as MAT 6-24.

3.0 PROCEDURE

Generally, oven drying for 2 hours at 130°C will be sufficient, but this time may vary depending on the moisture content and grading of the sample. Determine the moisture content of an emulsified asphalt mix sample as follows:

1. Label and tare a drying pan. Record the "Container Number" and "Tare of Container" on line "C", to the nearest 0.1 gram, of the data sheet as shown in Figure 1.
2. Obtain 20 kg of representative emulsified mix as directed in ATT-37, SAMPLING MIXES, and put into a large plastic pail.
3. Empty the contents of the pail into a mixing pan and blend it to ensure a non-segregated sample.
4. Take a mix sample of at least 1,000 g from the mixing pan and place it in the tared drying pan. Weigh and record as "Wt. of Wet Sample + Tare" on line "A", to the nearest 0.1 gram.
5. Place the pan containing the sample in the oven set at $130 \pm 5^\circ\text{C}$.
6. Dry the sample to a constant weight. To verify, place the sample back in the oven for another hour, then re-weigh. Repeat the drying and weighing at one hour intervals until two consecutive weights remain the same.
7. Weigh the oven dried sample and record as "Wt. of Dry Sample + Tare" on line "B", to the nearest 0.1 gram.

 Transportation MAT 6-24/22	MOISTURE CONTENT			
	PROJECT :	Hwy 36:04	Contractor :	ABC Const.
	CONTRACT NO. :	12345	DATE :	18-Aug-2021
	ATT-15 MOISTURE CONTENT, Part II, Oven Method		TECH :	J. Jones

SAMPLE IDENTIFICATION					
DATE	18-Aug-2021		18-Aug-2021		18-Aug-2021
LOT NUMBER					
TEST NUMBER					
SAMPLE SOURCE	Windrow		Windrow		Windrow
STATION	9+183		9+391		9+516
DRYING TIME	2.5 hr		2.5 hr		2.5 hr
DEPTH BELOW GRADE OR LIFT	1st Lift		1st Lift		1st Lift

MOISTURE CONTENT						
CONTAINER NUMBER	g	X		Y		Z
A. WEIGHT OF WET SAMPLE + TARE	g	1654.5		1666.4		1737.2
B. WEIGHT OF DRY SAMPLE + TARE	g	1614.9		1626.5		1693.8
C. TARE OF CONTAINER	g	651.1		652.3		647.3
D. WEIGHT OF WATER	A - B	g	39.6	39.9		43.4
E. WEIGHT OF DRY SAMPLE	B - C	g	963.8	974.2		1046.5
F. MOISTURE CONTENT	(D/E) x 100	%	4.11	4.10		4.15

REMARKS: Moisture Content of HF 500 mix**EMULSIFIED ASPHALT MIXES**

FIGURE 1

8. Calculate the "Weight of Water" removed on line "D" as follows:

$$\text{Wt. of Water} = (\text{Wt. of Wet Sample} + \text{Tare}) - (\text{Wt. of Dry Sample} + \text{Tare})$$

9. Determine the "Weight of Dry Sample" on line "E" as follows:

$$\text{Wt. of Dry Sample} = (\text{Wt. of Dry Sample} + \text{Tare}) - (\text{Tare of Container})$$

10. Calculate the "Moisture Content" of the sample, to the nearest 0.01%, on line "F", using the formula:

$$\text{Moisture Content (\%)} = \frac{\text{Wt. of Water}}{\text{Wt. of Dry Sample}} \times 100\%$$

4.0 HINTS AND PRECAUTIONS

1. Ensure that the oven temperature is maintained at $130 \pm 5^{\circ}\text{C}$. Do not allow the oven door to stay open for too long as it takes a while for the oven to regain the drying temperature.
2. The drying rate of test samples will be affected by the moisture conditions and number of samples in the drying device. When wet samples are placed in the drying device along with nearly dry samples, the drying cycle will have to be re-started.
3. Do not put moist samples in the oven on a shelf below dry samples. Moist samples should be placed on the top shelf and all partially dried samples placed on the lowest shelf.
4. **Do not over-load the lab drying oven**, as samples will require a much longer drying time.
5. Oven dried soil samples left to cool too long before weighing may absorb moisture from the atmosphere, thereby altering their weight. Instead, remove the oven dry samples from the oven, then **allow the pan and dried sample to COOL, just until the pan can be handled without gloves, then IMMEDIATELY weigh the samples.**
6. Keep the laboratory countertops clean so that spilled samples can be readily noticed and retrieved.
7. **Checking every moisture content sample to determine if it is dried to a constant weight is impractical.** In most cases, drying of a moisture content sample overnight (16 hours) is sufficient. Drying times may need to be extended if the oven is full. Sand samples may often be dried to constant weight after 7 hours.
8. **Moisture Content samples should be discarded after testing, and should not be used in any other tests**, due to particle breakdown, chemical changes or losses, melting, or losses of organic constituents.
9. Use heat-resistant gloves, or tongs, when handling hot samples.
10. Use a separate mix sample (from the same pail of mix) for the extraction test as described in ATT-12, Part I or II. The sample must be at least 2,000 g and dried to a constant weight before the extraction test.
11. It is recommended that Balance Check Weights should be used daily, and the results recorded, to identify if calibration drift has occurred. Drift can occur for any number of reasons: such as temperature changes, being moved, or aging electronics.

ATT-15, Part II

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