

State of Nevada
Department of Transportation
Materials Division

**METHOD OF TEST FOR DETERMINING MOISTURE CONTENT OF ASPHALT MIXTURES
OR MINERAL AGGREGATE USING MICROWAVE OVENS**

SCOPE

This method provides a rapid field test procedure for determining the amount of moisture for asphaltic mixtures or mineral aggregate used in asphaltic mixtures.

APPARATUS

1. Microwave oven, capable of holding a 4000 g sample.
2. Sample containers, capable of holding 600 g (must be paper, glass or ceramic).
3. Balance, with 1000 g capacity, readable to 0.1 g.
4. Riffle splitter, having 37.5 mm (1 1/2 in.) wide riffles.
5. Spatula, approximately 25.4 mm (1 in.) wide and 254 mm (10 in.) long.
6. Heat resistant gloves.
7. Cylinder molds, complete with lids 152.4 mm (6 in.) diameter x 304.8 mm (12 in.) length.
8. Tape for sealing cylinder molds.
9. 600 mL beaker.

SAMPLE PREPARATION

1. Obtain approximately 2000 g of mineral aggregate or asphaltic mix.
2. Use the riffle splitter to obtain a 500 ± 50 g sample.

PROCEDURE

1. Place 600 mL beaker filled with water in microwave oven, keep beaker at least half full at all times.
2. Place the sample in a tared paper plate or glass container, and weigh to the nearest 0.1 g.
3. Put sample in microwave oven and turn oven on.
4. After 10 minutes, turn the oven off, remove the container and sample, weigh the sample and container to the nearest 0.1 g, and record the weight.
5. Place sample and container back in the oven. Turn oven on, and dry sample for 5 more minutes.
6. Remove sample and container from oven, weigh to the 0.1 g, and record weight.
7. Repeat steps 5 and 6 until a constant weight is obtained. Note: In most cases, with moisture contents of 1.0% or less, a 10 minute drying period is sufficient.

CALCULATIONS

After a constant weight has been obtained, calculate the moisture content of the samples as follows:

$$\% \text{ Moisture} = \frac{(\text{original weight}) - (\text{final weight})}{\text{final weight}} \times 100$$

REPORT

Moisture content shall be reported to the nearest 0.1.

PRECAUTIONS

1. Use gloves for handling hot mixtures during quartering and when placing in or removing from oven.
2. Do not use metal containers in oven at any time. Damage to the oven will occur.
3. Do not delay getting sample into oven after sampling. (If a delay of 15 minutes or more is anticipated, samples must be placed into and kept in sealed containers. For reliable results, all samples should be tested within 1 hour of sampling).
4. When weighing samples, do so as quickly as possible to avoid error in the balance due to heat transfer.