



Standard Test Procedures Manual

Section: SOILS

Subject: MOISTURE BY MICROWAVE OVEN

1. SCOPE

1.1. Description of Test

This method described the procedures for determining the moisture content of a soil by microwave oven.

2. APPARATUS AND MATERIALS

2.1. Equipment Required

Balance - 0.01 g accuracy.

Containers - suitable for use in microwave oven.

Microwave oven equipped with timing device and heat intensity control.

3. PROCEDURE

3.1. Test Procedure

Obtain a representative sample usually between 150-250 g of the material to be tested.

Place the sample in the container for which the weight is known and weigh and record as the "wet soil and tare."

Dry the sample in the microwave oven for approximately 5 minutes. The time may vary as it takes longer to dry a wet sample than a moderately moist sample. A time factor for the type of material to be tested can be established by comparing the results using test method STP 205-3 on a few preliminary samples.

Remove the sample from the oven, let cool, weigh and record "dry soil and tare."

4. RESULTS AND CALCULATIONS

4.1. Calculations

Calculate the moisture content in the manner shown by the following example:

weight of wet soil and tare	- 141.69	g
weight of dry soil and tare	- 127.49	g
weight of water	- 14.20	g
weight of tare	- 35.86	g
weight of dry soil	- 91.63	g
Moisture Content %	- 15.50	g

$$\text{Moisture Content} = \frac{\text{wt. of water}}{\text{wt. of dry soil}} \times 100$$

4.2. Reporting Results

Report percent moisture on form MR-20.

5. ADDED INFORMATION

5.1. General

This test is usually accurate to within about 1% of the true moisture content using the oven dry method (STP 205-3).

Since the sample for moisture content is small, great care must be taken to ensure that the sample is representative.

Samples which contain organic matter may be affected by the microwave oven and a correction factor should be established using the oven dried method.

Care must be taken when drying more than one sample at a time as the time varies with the moisture content of the sample. The drying time will depend on the capacity of the microwave oven and whether the oven is equipped with a vent or a discharge fan.

To prevent damage to the oven it may be necessary to place water in a glass container in the oven if the oven is used with no samples or the moisture content of the sample tested is very low.