

**Standard Method of Test for
Determining Moisture Content of Soils by Carbide Gas
Method**

SCDOT Designation: SC-T-22 (9/08)

1. SCOPE

- 1.1. This method covers a procedure for determining in the field the amount of moisture in a soil or fine aggregate. A carefully weighed soil sample and a powder reagent are introduced into a container with the pressure of the gas evolved from the chemical reaction being measured on a gauge that is specially calibrated to read moisture content.
- 1.2. This standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. SUMMARY OF TEST METHOD

- 2.1. The moisture content of a sample of soil is obtained by measuring the pressure created by chemical reaction between the moisture in the soil and calcium carbide reagent.

3. SIGNIFICANCE AND USE

- 3.1. The moisture content of a sample of soil or fine aggregate can be obtained quickly in the field.

4. APPARATUS

- 4.1. Speedy Moisture Tester, two 1¼-inch steel balls, calcium carbide reagent, and conversion chart for moisture content.

5. TEST SPECIMENS

- 5.1. A representative soil or fine aggregate sample weighing 20 grams or 26 grams, depending on the model of the Speedy Moisture Tester. Consult the manufacturer's instructions. For materials with higher moisture content than the gauge limit, use only half the standard weight of sample.

6. PROCEDURE

- 6.1. For the 26-gram Tester:
 - 6.1.1. Place two 1¼-inch steel balls in the body of the tester. Add 3 scoops of reagent to the body of the tester.

- 6.1.2. Place the 26-gram soil sample in the cap of the tester. Take care not to allow the moist soil to come into contact with the reagent before the body of the tester is sealed.
- 6.1.3. With the body of the tester in the horizontal position, place the cap in place. Bring the stirrup in place and screw down to seal the instrument pressure tight. Raise the tester to the vertical position so as to empty the soil sample on top of the reagent.
- 6.1.4. With the instrument in the horizontal position, manually rotate the device so the steel balls are put into orbit around the inside circumference. During this shaking action, the steel balls break down the lumpy soil. Continue shaking for approximately 1 to 3 minutes until the gauge needle stops moving. With the device in the horizontal position, at eye level, read the dial and refer to the conversion chart for moisture content, which is supplied with the Speedy Moisture Tester.
- 6.1.5. When the sample is dumped, examine the cap to see if all the soil was removed and examine the soil for lumps. If any soil remained in the cap or remained lumpy, obtain another sample and re-run the test.
- 6.1.6. After each test, the instrument should be thoroughly cleaned, using the brush to clean the bomb and the cloth to clean the cap. The cap should not be beat on a hard surface. Do not use brush or air. Scales should be balanced frequently.
- 6.2. For 20-gram Tester:
 - 6.2.1. Place two 1¼-inch steel balls in the body of the tester. Add 3 scoops of reagent to the body of the tester.
 - 6.2.2. Place the 20-gram soil sample in the cap of the tester. Take care not to allow the moist soil to come into contact with the reagent before the body of the tester is sealed.
 - 6.2.3. Run the test as described above for the 26-gram tester.

7. REPORT

- 7.1. Report the moisture content in the sample as read from the oven moisture conversion chart to the nearest 0.1 percent on SCDOT Form 200.02 – Percent Compaction by Nuclear Gauge or SCDOT Form 200.03 – Percent Compaction by Nuclear Gauge-Direct Read Gauge, as appropriate.