Standard Test Procedures Manual

Section: SOILS

Subject: MOISTURE BY SPEEDY TESTER

1. SCOPE

1.1. Description of Test

This method describes the procedure for determining the moisture content of soils and other materials. The reaction of water with calcium carbide produces acetylene gas which activates a pressure gauge that is calibrated to read as percent moisture.

2. APPARATUS AND MATERIALS

2.1. Equipment Required

Speedy moisture test kit which includes, scoop, balance, speedy moisture meter, measuring spoon, steel balls, speedy absorbent, weights, small brush.

3. PROCEDURE

3.1. Test Procedure

Set up apparatus as shown on diagram in kit.

Clean the cap and body of moisture meter with brush.

Place three measures of speedy absorbent into body of moisture meter and also the two steel balls.

Weigh 26 grams of soil for testing - (the scale is calibrated to balance at exactly 26 g) and place sample to be tested in cap of meter.

With meter in horizontal position put cap on and tighten clamp.

Tip speedy meter to vertical position so absorbent contacts the soil, then return it to the horizontal position. Holding it with both hands, begin a circular motion so that balls are put into orbit inside the meter. Rotate for 10 seconds - rest for 20 seconds.

Repeat rotate - rest cycle until dial remains constant (usually about 3 minutes).

Hold meter in horizontal position and read dial when it comes to rest.

With speedy meter in vertical position carefully release pressure away from you, then empty contents and clean apparatus.

If moisture is in excess of 20%, then use half sample weight (13 grams). Use weight provided for this purpose, then follow same procedure except that the reading is multiplied by two.

4. RESULTS AND CALCULATIONS

4.1. Calculations

The reading on the dial is the moisture content based on the wet-weight of soil. Convert it to the dry-weight basis with the following formula.

$$\%\ Moist_{(DryWt.)} = \frac{\%Moist_{(WetWt.)}\ x100}{100 - \%Moist_{(Wet.Wt.)}}$$

4.2. R
Reporting Results

Report results on Form MR-20.

5. ADDED INFORMATION

Since the sample for moisture content is very small, great care must be taken to make sure the sample is representative.

This test is usually accurate to within about 1 or 2% of the true moisture content. If greater accuracy is required, use the oven dry method (STP 205-3).

Two problems often occur with the apparatus so be aware of them: one is the pressure gauge which may lose its calibration and the second is the tiny passage between the main chamber and the pressure gauge, which may become plugged. To avoid erroneous results, compare several speedy meter tests to duplicate oven-dry tests. If the difference is substantial, return the speedy meter to the central laboratory for repairs.

The steel balls in the main chamber are used to pulverize and mix the soil and absorbent. They should be put in orbit around the circumference of the chamber. Never use an end to end motion because the balls will seal off the opening to the pressure gauge by riveting it closed.

Because the dial readings give moisture content based on wet weight of soil, the results are lower than our normal dry-weight based tests. Below 10% the results are "close enough", but at 20%, the tests are 5% low, so corrections are needed. Use the formula given under "CALCULATIONS" to prepare a chart showing corrected moisture content for each dial reading.

APPROVAL SHEET

New __ Revision _X_ Date of Previous Document 82-04-01
Effective Date: - -

Description of Revision (Reason for Revision):
Format of test procedure updated.

Review/Implementation Process:
Reviewed by the Materials Section of the Technical Standards and Policies Branch.

Other Manuals/Policies Affected:
Nil

Follow Up/Training Required:
Nil

Comments/Concerns/Implications (Budget/Environment/Stakeholders):

Prepared and Recommended by D. MacLeod — 93-11-24
Materials Standards Engineer — Date

Approval Recommended by R.A. Widger — - -
Senior Materials Engineer — Date

Approval Recommended by A.R. Gerbrandt — - -
Dir., Technical Standards & Policies Br. — Date

Approved by D.G. Metz — - -
Assistant Deputy Minister, Infrastructure — Date

Electronic File Updated 94-03-09
Update Mailed - -