EXPERIMENT 1
WATER CONTENT DETERMINATION

Purpose:

This test is performed to determine the water (moisture) content of soils. The water content is the ratio, expressed as a percentage, of the mass of "pore" or "free" water in a given mass of soil to the mass of the dry soil solids.

Standard Reference:

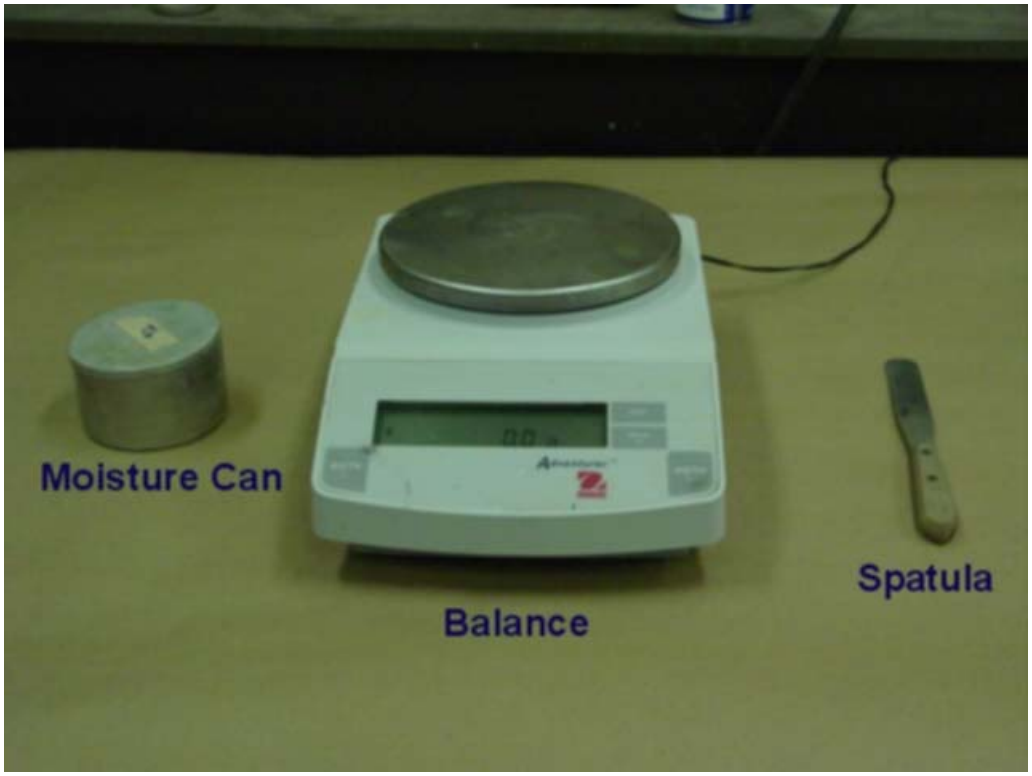
ASTM D 2216 - Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

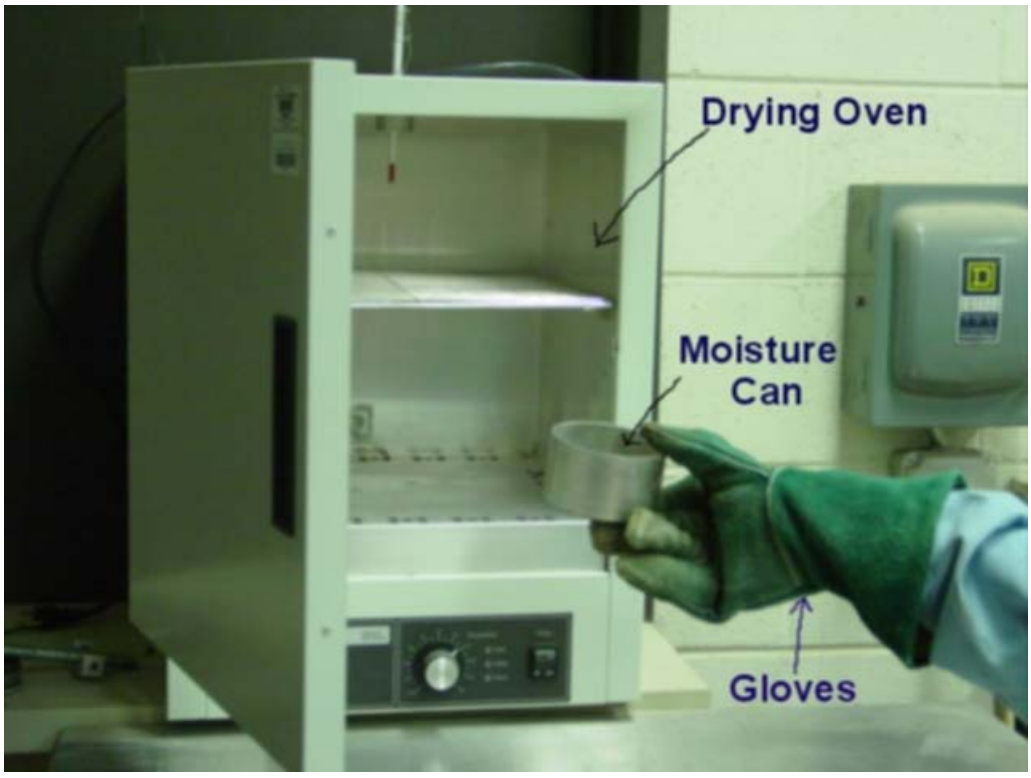
Significance:

For many soils, the water content may be an extremely important index used for establishing the relationship between the way a soil behaves and its properties. The consistency of a fine-grained soil largely depends on its water content. The water content is also used in expressing the phase relationships of air, water, and solids in a given volume of soil.

Equipment:

Drying oven, Balance, Moisture can, Gloves, Spatula.


Moisture Can
Balance
Spatula


Drying Oven
Moisture Can
Gloves

Test Procedure:

(1) Record the moisture can and lid number. Determine and record the mass of an empty, clean, and dry moisture can with its lid (M_C)

(2) Place the moist soil in the moisture can and secure the lid. Determine and record the mass of the moisture can (now containing the moist soil) with the lid (M_{CMS}).

(3) Remove the lid and place the moisture can (containing the moist soil) in the drying oven that is set at 105 °C. Leave it in the oven overnight.

(4) Remove the moisture can. Carefully but securely, replace the lid on the moisture can using gloves, and allow it to cool to room temperature. Determine and record the mass of the moisture can and lid (containing the dry soil) (M_{CDS}).

(5) Empty the moisture can and clean the can and lid.

Data Analysis:

(1) Determine the mass of soil solids.

$$M_S = M_{CDS} - M_{SC}$$

(2) Determine the mass of pore water.

$$M_W = M_{CMS} - M_{CDS}$$

(3) Determine the water content.

$$w = \frac{Mw}{Ms} x100$$

EXAMPLE DATA

WATER CONTENT DETERMINATION
DATA SHEET

Date Tested: August 30, 2002

Tested By: CEMM315 Class, Group A

Project Name: CEMM315 Lab

Sample Number: B-1,AU-1, 0'-2'

Sample Description: Gray silty clay

Specimen number	1	2
Moisture can and lid number	12	15
M_C = Mass of empty, clean can + lid (grams)	7.78	7.83
M_{CMS} = Mass of can, lid, and moist soil (grams)	16.39	13.43
M_{CDS} = Mass of can, lid, and dry soil (grams)	15.28	12.69
M_S = Mass of soil solids (grams)	7.5	4.86
M_W = Mass of pore water (grams)	1.11	0.74
w = Water content, w%	14.8	15.2

Example Calculation: $M_C = 7.78g$, $M_{CMS} = 16.39g$, $M_{CDS} = 15.28g$

$M_S = 15.28 - 7.78 = 7.5g$

$M_W = 16.39 - 15.28 = 1.11g$

$$w = \frac{1.11}{7.5} x100 \quad = 14.8\%$$

BLANK DATA SHEETS

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