



P.O. Box 52025  
Phoenix, AZ 85072-2025  
(602) 236-5900

Case 11-11(a)

DATE: May 4, 2011  
TO: MAG Specifications and Details Committee Members  
FROM: Peter Kandaris, SRP Representative  
RE: **Superseded ASTM Specification: Nuclear Density Testing of Soil**

Purpose: ASTM standard D3017, "Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)," and standard D2922, "Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)" were withdrawn in 2007 and replaced with ASTM D6938, "Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)."

Revisions: Replace references to ASTM D3017 & D2922 with ASTM D6938 in the following MAG specification pages and paragraphs:

Page	Paragraph
211-2	211.4
301-1	301.3
311-2	311.4.4
312-1	312.3
313-2	313.8
601-2	601.2.5
601-5	601.4.4
620-1	620.3.1

**Withdrawn Standard:** ASTM D3017-05 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) (Withdrawn 2007)

Developed by Subcommittee: D18.08

**WITHDRAWN, REPLACED BY [D6938](#)**

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### **Withdrawn Rationale:**

This test method covers the determination of water content of soil and rock by the thermalization or slowing of fast neutrons where the neutron source and the thermal neutron detector both remain at the surface.

Formerly under the jurisdiction of ASTM Committee D18 on Soil and Rock, his test method was discontinued in May 2007.

### **1. Scope**

1.1 This test method covers the determination of water content of soil and rock by the thermalization or slowing of fast neutrons where the neutron source and the thermal neutron detector both remain at the surface.

1.2 The water content in mass per unit volume of the material under test is determined by comparing the detection rate of thermalized or slow neutrons with previously established calibration data.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound equivalents may be approximate.

1.3.1 It is common practice in the engineering profession to concurrently use pounds to represent both a unit of mass (lbm) and of force (lbf). This implicitly combines two systems of units, that is, the absolute system and the gravitational system. This test method has been written using the absolute system for water content (kilograms per cubic metre) in SI units. Conversion to the gravitational system of unit weight in lbf/ft<sup>3</sup> may be made by multiplying by 0.06243 or in kN/m<sup>3</sup> by multiplying by 9.807. The recording of water content in pound-force per cubic foot should not be regarded as non-conformance with this test method although the use is scientifically incorrect.

This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

ASTM D2922-05

**Withdrawn Standard:** ASTM D2922-05 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth) (Withdrawn 2007)

Developed by Subcommittee: D18.08

**WITHDRAWN, REPLACED BY [D6938](#)**

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### **Withdrawn Rationale:**

These test methods cover the determination of the total or wet density of soil and soil-rock mixtures by the attenuation of gamma radiation where the source and detector(s) remain on the surface (Backscatter Method) or the source or detector is placed at a known depth up to 300 mm (12 in.) while the detector(s) or source remains on the surface (Direct Transmission Method).

Formerly under the jurisdiction of ASTM Committee D18 on Soil and Rock, these test methods were discontinued in May 2007.

### **1. Scope**

1.1 These test methods cover the determination of the total or wet density of soil and soil-rock mixtures by the attenuation of gamma radiation where the source and detector(s) remain on the surface (Backscatter Method) or the source or detector is placed at a known depth up to 300 mm (12 in.) while the detector(s) or source remains on the surface (Direct Transmission Method).

1.2 The density in mass per unit volume of the material under test is determined by comparing the detected rate of gamma radiation with previously established calibration data.

1.3 The values tested in SI units are to be regarded as the standard. The inch-pound equivalents may be approximate.

1.4 It is common practice in the engineering profession to concurrently use pounds to represent both a unit of mass (lbm) and a unit of force (lbf). This implicitly combines two separate systems of units; that is, the absolute system and the gravitational system. It is scientifically undesirable to combine the use of two separate sets of inch-pound units within a single standard. These test methods have been written using the gravitational system of units when dealing with the inch-pound system. In this system the pound (lbf) represents a unit of force (weight). However, the use of balances or scales recording pounds of mass (lbm), or the recording of density in  $\text{lbm/ft}^3$  should not be regarded as nonconformance with these test methods.