Designation: D4843 – 88 (Reapproved 2004)ε1

Standard Test Method for Wetting and Drying Test of Solid Wastes[1]

This standard is issued under the fixed designation D4843; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

ε[1] NOTE—Editorial changes were made in June 2004.

1. Scope

1.1 This test method covers procedures for determining material losses produced by repeated wetting and drying of solid waste specimens. It also covers the visual observation of the disintegration of solid specimens.

1.2 This test method intends that the material used in the procedure be physically, chemically, and biologically representative; hence it does not address problems as a result of the inhomogeneity of specimens.

1.3 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C305 Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency

D2216 Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

3. Significance and Use

3.1 This test method is intended for the evaluation of the wetting and drying resistance of monolithic, solid, solidified/stabilized wastes under the testing conditions of this test method.

3.2 This test method may be used for the comparison of wetting and drying resistance of wastes.

3.3 Data tabulated in Table 1, Table 2, and Table 3 may be used to observe irregularities caused by inhomogeneity of specimens and/or comparison of mass loss-cycle relations of different wastes, as well as to measure method-related mass losses such as matrix dissolution.

4. Apparatus

4.1 *Disposable Molds*, 44 mm inside diameter by 74 mm in length.

4.2 *Balance or Scale*, with a capacity at least 50 % greater than the mass of the specimen and beaker, and a sensitivity of 0.01 g.

4.3 *Drying Oven*, a thermostatically controlled drying oven capable of maintaining a temperature of 60 ± 2°C; to be used for drying moisture specimen and for the solids content determination.

4.4 *Oven*, capable of maintaining a temperature of 60 ± 3°C; at a nitrogen purge rate specified in 4.5.

4.5 *Flow Controller*, to set nitrogen purge flow at a rate that will give 30 ± 5 min residence time.

4.6 *Moisture Chamber*, a suitably covered container capable of maintaining a temperature of 20 ± 3°C and minimum 95 % relative humidity, for preconditioning specimens.

4.7 *Beakers*, 400-mL size (narrow type), to store sample and to collect particulates.

4.8 *Tongs*, to handle samples.

5. Sample Preparation

5.1 *Specimen Size*—44 mm diameter by 74 mm in length.

5.1.1 Specimens may be cut to size from larger samples.

5.1.2 Specimens can also be molded in disposable plastic molds. When molding specimens refer to Practice C305 (see 2.1).

NOTE 1—Practice C305 refers to pastes and mortars. Molding materials with different consistency may require modifications and may result in different precision.

5.2 Condition samples that are not molded for this test in the moisture chamber for a period of seven days.

[1] This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.06 on Analytical Methods.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

TABLE 1 Control Group

Laboratory:
Technician:

Sample name:
Sample Id No.:
Test Start Date:

Sample / Cycle No.	1					2					3				
Date	$T_{i,c,1}$	$B_{i,c,1}$	$W_{i,c,1}$	$M_{c,1}$	$R_{i,c,1}$	$T_{i,c,2}$	$B_{i,c,2}$	$W_{i,c,2}$	$M_{c,2}$	$R_{i,c,2}$	$T_{i,c,3}$	$B_{i,c,3}$	$W_{i,c,3}$	$M_{c,3}$	$R_{i,c,3}$
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2.															
3.															
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11.															
12.															

TABLE 2 Sample Group

Laboratory:
Technician:

Sample name:
Sample Id No.:
Test Start Date:

Sample / Cycle No.	1					2					3				
Date	$T_{i,s,1}$	$B_{i,s,1}$	$W_{i,s,1}$	$M_{s,1}$	$R_{i,s,1}$	$T_{i,s,2}$	$B_{i,s,2}$	$W_{i,s,2}$	$M_{s,2}$	$R_{i,s,2}$	$T_{i,s,3}$	$B_{i,s,3}$	$W_{i,s,3}$	$M_{s,3}$	$R_{i,s,3}$
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5.2.1 Samples molded for this test have to be cured in the moisture chamber for a period of 28 days.

6. Procedure

6.1 Select one specimen for moisture content determination.

6.2 Determine moisture content of sample with Test Method D2216 but revised to use a temperature of 60 ± 3°C (see section 2.2).

6.3 Select three specimens for testing and three for control and mark them respectively.

6.4 Weigh specimens (accuracy to 0.01 g).

6.5 Place each specimen into a beaker of known tare mass (accuracy to 0.01 g) and cover it.

6.5.1 Use watch glass or plastic wrap.

6.5.2 The tare mass of beaker shall be determined after drying in accordance with Test Method D2216.

6.6 Place the three beakers containing the testing specimens in an oven. Maintain the temperature at 60 ± 3°C for 24 h while purging the oven with nitrogen gas at the controlled flow rate corresponding to 30 ± 5 min residence time.

6.6.1 In order to remove moisture from the nitrogen stream, a water-cooled condenser and condensate collection flask may be used downstream from the oven.

6.7 Store the three beakers with the control specimens in the moisture chamber at 20°C for 24 h.