

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

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TEST METHODS FOR WOOD CELLULOSE FIBER MULCHES

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1.0 PURPOSE

- 1.1 This procedure was developed to establish test methods to be used in determining the moisture content, net dry weight (mass), and water holding capacity of wood cellulose fiber mulch as packaged.

2.0 SCOPE

- 2.1 This procedure shall apply to all wood cellulose fiber mulches used for vegetation establishment.

3.0 APPARATUS AND EQUIPMENT

Scale capable of weighing 45.36 kg accurately to the nearest .045 kg.

Scale capable of weighing accurately to nearest 0.1 gram.

Oven capable of maintaining  $100 \pm 2^{\circ}\text{C}$ .

Three 3.8 liter or 4 liter container.

Three 75  $\mu\text{m}$  mesh screens to cover containers.

One 75  $\mu\text{m}$  sieve, 203 m x 51 mm.

Cover for sieve - may be aluminum foil.

One 1,000 ml graduated glass beaker.

Pan to partly submerge sieve.

Demineralized water.

Sink and/or area free of drafts to drain sample.

4.0 PROCEDURES

4.1 Moisture Content

4.1.1 The moisture content shall be determined from the average results of three (3) separate samples. Take one (1) sample from the top, center, and bottom portions of the bag.

4.1.2 For each sample, loosely fill a liter container of known weight with mulch to approximately 25  $\mu$ m of the top.

4.1.3 Weigh immediately and cover the container with 75  $\mu$ m screen.

4.1.4 Dry in oven at  $100 \pm 2^{\circ}\text{C}$  until constant weight is achieved.

4.1.5 Cool to room temperature. Remove screen and weigh container and mulch.

4.1.6 The percent (%) moisture (as received) is determined by the following formula:

$$\% \text{ Moisture} = \frac{A-B}{A-C} \times 100$$

Where: A = original weight of container and mulch(gms)  
B = weight of container and dry mulch(gms)  
C = weight of container(gms)

4.1.7 Average the results of the three (3) separate percent moisture content tests.

4.2 Net Dry Weight

4.2.1 Weigh a container of mulch as received and record this weight.

- 4.2.2 The net dry weight of the packaged fiber mulch is determined from the following formula:

$$\text{Net Dry Weight of Packaged Product} = X - (X \times Y)$$

Where: X = actual weight of packaged mulch as determined in 4.2.1  
Y = percent average moisture as determined in 4.1.7 divided by 100

- 4.2.3 Compare the computed net dry weight with the net dry weight printed on the container.

- 4.2.4 If the net dry weight of the container is less than that marked on the bag, the Contractor shall supply extra material to make up the difference.

#### 4.3 Water Holding Capacity

- 4.3.1 Determine the average percent moisture content in accordance with Section 4.1.

- 4.3.2 Weigh a sample of "as-is" material equivalent to 12.0 grams of oven-dry fiber. Weigh to the nearest 0.1 gram and place into a 1,000 ml beaker. The equivalent weight can be determined by the following formula:

$$\text{"As is" weight} = \frac{12.0}{1 - \% \frac{\text{Average Moisture}}{100}}$$

- 4.3.3 Add 800 ml of demineralized water to the sample, stir and/or shake until thoroughly mixed. Allow to stand for 30 minutes.

- 4.3.4 Wet a 75  $\mu\text{m}$  sieve. Cover the top of the sieve with aluminum foil or other material to retard evaporation. Prop the sieve up at an angle of 30° - 45° and drain for 10 minutes. Remove cover and wipe excess water from the outside of sieve and weigh immediately.

- 4.3.5 Place sieve in pan and pour fiber onto screen. Add sufficient water to float fibers inside of sieve. Stir, so that the fiber will form a uniform mat over the screen area. Carefully top to retard evaporation. Prop the


sieve up at an angle of 30° - 45° and drain for 10 minutes. Remove cover and wipe excess water from the outside of sieve and weigh immediately.

- 4.3.6 Obtain the weight of the wet mat by subtracting the sieve weight (4.3.4) from the total weight (4.3.5).
- 4.3.7 Calculate the water holding capacity by use of the following formula:

% Water Holding Capacity =

$$\frac{\text{Weight Wet Mat} - 12.0}{\text{Weight Wet Mat}} \times 100$$

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