



## Standard Test Method for Bulk Density of Densified Particulate Biomass Fuels<sup>1</sup>

This standard is issued under the fixed designation E 873; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the procedure for the determination of bulk density (or bulk specific weight) of densified particulate biomass fuels with a maximum particle volume of  $16.39 \text{ cm}^3$  (1 in.<sup>3</sup>).

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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. Significance and Use

2.1 The test procedures described in this test method can be used to determine the bulk density (or bulk specific weight) of any densified particulate biomass fuel meeting the requirements specified in this test method.

### 3. Apparatus

3.1 *Box* of nominal 305 by 305 by 305-mm (12 by 12 by 12-in.) dimensions with handles. The box material shall be dimensionally stable. The volume shall be determined to within  $16.39 \text{ cm}^3$  (1 in.<sup>3</sup>).

3.2 *Scales* of such capacity as to weigh the box and sample to within 100 g.

### 4. Sampling

4.1 *Place of Sampling*—Sample fuel while it is being loaded into or unloaded from means of transportation or when discharged from storage bins or conveyors.

NOTE 1—Samples collected from the surface of piles are, in general, unreliable because of the exposure to the environment. If necessary, collect nine increments from a foot or more below the surface at nine points covering the pile.

#### 4.2 Collection of Gross Sample:

4.2.1 Collect increments regularly, systematically, and with such frequency that the entire quantity of pellets sampled will be represented proportionally in the gross sample.

4.2.2 The quantity of the sample shall be large enough to be representative but not less than 45.45 kg (100 lb).

### 5. Procedure

5.1 Weigh and record the empty box weight within 100 g (0.22 lb). Fill the box by pouring from a height of 610 mm (2 ft) above the top edge of the container. Drop the box five times from a height of 150 mm (6 in.) on to a nonresilient surface to allow settling. Add additional sample and strike off the excess sample level with the top edge.

5.2 Then weigh the box and sample to within 100 g (0.22 lb) and record the total weight.

### 6. Calculation

6.1 Calculate bulk density as follows:

$$\text{Bulk density, g/cm}^3 = \frac{(\text{weight of box and sample}) - (\text{weight of box})}{(\text{volume of box})}$$

### 7. Precision and Bias

7.1 Precision and bias statements are in the process of being balloted. Subsequently, they will be added to this test method.

<sup>1</sup>This test method is under the jurisdiction of ASTM Committee E-48 on Biotechnology and is the direct responsibility of Subcommittee E48.05 on Biomass Conversion Systems.

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