



## Standard Test Method for Determination of Total Solids in Biomass<sup>1</sup>

This standard is issued under the fixed designation E 1756; 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.

### INTRODUCTION

The total solids content is used to adjust the mass of the biomass so that all analytical results may be reported on a moisture-free basis. Total solids content may be determined by overnight drying at 105°C in a convection oven or with a loss-on-drying moisture analyzer.

### 1. Scope

1.1 This test method covers the determination of the amount of total solids remaining after drying a sample. Materials suitable for this procedure include samples prepared in accordance with Practice E 1757 and extractive-free material prepared in accordance with Test Method E 1690. For particulate wood fuels, Test Method E 1534 should be used.

1.2 The values stated in SI units are to be regarded as the standard.

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:

E 1534 Test Method for Determination of Ash Content of Particulate Wood Fuels<sup>2</sup>

E 1690 Test Method for the Determination of Ethanol Extractives in Biomass<sup>2</sup>

E 1757 Practice for Preparation of Biomass for Compositional Analysis<sup>2</sup>

### 3. Terminology

#### 3.1 Descriptions of Terms Specific to This Standard:

3.1.1 *oven-dried solids*—the solids remaining after heating the prepared biomass at 105°C to constant mass. For the purposes of this procedure, the moisture content of a biomass sample is considered to be the amount of mass lost during the drying of the sample at 105°C to constant mass. An inherent error of this and any oven-drying procedure is that volatile

substances other than water are removed from the sample during drying.

3.1.2 *prepared biomass*—the biomass that has been processed according to Practice E 1757 to reduce the moisture content to below 15 % by mass, based on an oven-dried solids mass.

### 4. Significance and Use

4.1 Moisture is a ubiquitous and variable component of any biomass sample. Moisture is not considered a structural component of biomass and can change with storage and handling of biomass samples. The determination of the total solids content allows for the correction of biomass samples to an oven-dried solids mass that is constant for a particular sample.

4.2 This procedure is not suitable for biomass samples that visibly change on heating, that is, unwashed acid-pretreated biomass still containing free acid.

4.3 Some materials that contain large amount of free sugars or proteins will caramelize or brown under direct infrared heating elements used in Test Method B. Total solids in these materials should be done by Test Method A.

### 5. Apparatus and Materials

5.1 *Analytical Balance*, sensitive to 0.1 mg.

5.2 *Drying Oven*, 105 ± 3°C (Test Method A only).

5.3 *Desiccator*, containing anhydrous calcium sulfate (Test Method A only).

5.4 *Moisture Analyzer*,<sup>3</sup> infrared heated, 20 g capacity, 1 mg resolution (Test Method B only).

5.5 *Drying Pans*, disposable, aluminum, 10 cm diameter, suitable for moisture analyzer (Test Method B only).

### 6. Sampling

6.1 The sample is material prepared according to Practice

<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.

Current edition approved Oct. 10, 1995. Published December 1995.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.05.

<sup>3</sup> A Denver Instruments, Model IR-100, available from Denver Instrument Company, 6542 Fig St., Arvada, CO 80004, has been found to be satisfactory for this purpose.