



Designation: E872 – 82 (Reapproved 2013)

## Standard Test Method for Volatile Matter in the Analysis of Particulate Wood Fuels<sup>1</sup>

This standard is issued under the fixed designation E872; 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 determines the percentage of gaseous products, exclusive of moisture vapor, in the analysis sample of particulate wood fuel that is released under the specific conditions of the test. The particulate wood fuel may be sanderdust, sawdust, pellets, green tree chips, hogged fuel, or other type particulate wood fuel having a maximum particle volume of 16.39 cm<sup>3</sup> (1 in.<sup>3</sup>). Volatile matter, when determined as herein described, may be used to indicate yields on processes to provide the basis for purchasing and selling or to establish burning characteristics.

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. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

D346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

D2013 Practice for Preparing Coal Samples for Analysis

E871 Test Method for Moisture Analysis of Particulate Wood Fuels

### 3. Summary of Test Method

3.1 Volatile matter is determined by establishing the loss in weight resulting from heating wood under rigidly controlled conditions. The measured weight loss, corrected for moisture as determined in Method E871, establishes the volatile matter content.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee E48 on Bioenergy and Industrial Chemicals from Biomass and is the direct responsibility of Subcommittee E48.05 on Biomass Conversion.

Current edition approved Aug. 15, 2013. Published November 2013. Originally approved in 1982. Last previous edition approved in 2006 as E872 – 82 (2006). DOI: 10.1520/E0872-82R13.

<sup>2</sup> 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.

### 4. Significance and Use

4.1 The test procedures described in this test method can be used to determine the percentage of gaseous products, exclusive of moisture vapor, of any particulate wood fuel meeting the requirements specified in this test method.

### 5. Apparatus

5.1 *Platinum Crucible*, with closely fitting cover, or a nickel-chromium crucible, with closely fitting cover, pre-fired to oxidize and stabilize the weight. The crucible shall be of not less than 10 or more than 20-mL capacity, not less than 25 or more than 35 mm in diameter, and not less than 30 or more than 35 mm in height.

5.2 *Vertical Electric Tube Furnace*—The furnace may be of the form shown in Fig. 1. It shall be regulated to maintain a temperature of 950 ± 20°C in the crucible, as measured by a thermocouple positioned in the furnace.

### 6. Procedure

6.1 *Sampling:*

6.1.1 *Place of Sampling*—Take sample where wood 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.

6.1.2 *Collection of Gross Sample:*

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

6.1.2.2 The quantity of the sample shall be large enough to be representative but not less than 10 kg (22 lb).

6.1.2.3 Place samples in an airtight container immediately after collection. Maintain samples in the airtight container whenever possible to prevent gains or losses in moisture from the atmosphere.

6.1.3 Sample reduction may be done by two methods, a coning and dividing process, or by using a riffle. Mixing, coning, and quartering are described and illustrated in Practice D346.

6.1.3.1 Coning and dividing reduction is accomplished by placing the gross sample on a sheet of rubber or oil cloth.