Designation: E 1288 – 89 (Reapproved 1994)

Standard Test Method for The Durability of Biomass Pellets[1]

This standard is issued under the fixed designation E 1288; 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.

1. Scope

1.1 This test method covers the determination of the relative durability of biomass fuel pellets by tumbling and sieve analysis.

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:*

D 346 Practice for Collection and Preparation of Coke Samples for Laboratory Analysis

D 2013 Method for Preparing Coal Samples for Analysis[2]

E 11 Specification for Wire-Cloth Sieves for Testing Purposes

3. Apparatus

3.1 *Square Hole Woven-Wire Cloth Sieves*, of the following sizes conforming to ASTM Specification E 11:

(1) 2.36 mm (No. 8)
(2) 1.18 mm (No. 16)
(3) 600 µm (No. 30)
(4) 300 µm (No. 50)
(5) 150 µm (No. 100)
(6) 75 µm (No. 200)

Optionally a seventh sieve, the next size opening smaller than the pellet diameter, can be included.

3.2 *Air-Tight Gross Sample Containers*, of a size as to contain the sample (see Note 1).

NOTE 1—The containers need to be air tight so as to minimize changes in the moisture content of the sample that may affect the test results. Heavy plastic bags are ideal since they minimize trapped air.

3.3 *Metal or Glass Laboratory Containers*, of such configuration as to facilitate the collection and weighing of samples during testing.

3.4 *Metal Tumbler*, 304 by 304 and 127 mm, (12 in. by 12 in. and 5 in. deep), rotated about an axis perpendicular to and centered in the 304-mm (12-in.) sides. A508 by 229-mm (2 by 9-in.) plate is affixed symmetrically along one of its 229-mm (9-in.) sides to a diagonal of one of the 304 by 304-mm (12 by 12-in.) sides. A dust-tight door (or doors) may be placed in any side. Projections shall be kept to a minimum and well rounded.

4. Sampling

4.1 *Place of Sampling*:

4.1.1 Sample pellets while they are being loaded into or unloaded from means of transportation or when they are discharged from storage bins or conveyors.

NOTE 2—Samples collected from 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 the Gross Sample*:

4.2.1 Collect increments regularly, systematically, and with such frequency, so 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).

4.2.3 Sample reduction may be done by two methods, a coning and dividing process, or by using a riffle.

4.2.3.1 Coning and dividing reduction is accomplished by placing the gross sample on a sheet of rubber or oil cloth. Thoroughly mix it by raising first one corner of the cloth and then the other. After mixing, cone and quarter the sample. Continue the operation until the sample is reduced sufficiently so that one fourth of the coning sample weighs about 1 kg (2.2 lb). This shall constitute a laboratory sample.

NOTE 3—The operations of mixing, coning, and quartering, are described and illustrated in Practice D 346.

4.2.3.2 Riffle reduction is accomplished by using a standard coal riffle. The gross sample is riffled repeatedly until one half of the riffle sample equals about 1 kg (2.2 lb) that will constitute a laboratory sample.

NOTE 4—Riffles and procedures are described in Method D 2013.

5. Procedure

TUMBLER TEST

5.1 *Laboratory Sample*:

5.1.1 Sieve the pellets to be tested through the largest sieve, and consider 250 g of the retained pellets a laboratory sample.

[1] This test method is under the jurisdiction of ASTM Committee