



Designation: E 1108 – 86 (Reapproved 1996)

Standard Test Method for Determination of the Recovery of a Product in a Materials Separation Device¹

This standard is issued under the fixed designation E 1108; 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 recovery of a desired product in a device processing solid waste for the purpose of concentrating a component of interest. The recovery is determined with respect to the amount of the desired component in one output stream (accepts) as opposed to another output stream (rejects). The results of this calculation determine the effectiveness of component separation when coupled with a measure of product purity as described in Test Method E 889.

1.2 *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.* Specific precautionary information is given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

E 889 Test Method for Composition or Purity of a Solid Waste Materials Stream²

E 1107 Test Method for Measuring the Throughput of Resource-Recovery Unit Operations²

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *accepts*—the output stream from the materials separation device that contains the highest concentration (purity) of the component(s) that the device is designed to separate.

3.1.2 *binary separator*—a device that separates a single input feed stream into two output or product streams.

3.1.3 *component*—any identifiable and defined fraction of solid waste.

3.1.4 *feed*—the input stream.

3.1.5 *gross sample*—a sample representing one lot and composed of a number of increments on which neither reduction nor division has been performed.

3.1.6 *laboratory sample (or analysis sample)*—a portion of one gross sample representative of a lot and taken at random from the gross sample.

3.1.7 *polynary separator*—a device that separates a single input feed stream into three or more output product streams.

3.1.8 *purity*—the purity of a stream is defined in terms of one or more identifiable components, x , y , z , etc. as separated by hand sorting. The composition for any component such as x is the mass of x in a stream divided by the total mass of that stream. Purity is expressed as a fraction, decimal fraction or percent.

3.1.9 *recovery*—the fraction (on a percentage basis) of a specific component, x , in an input process stream (feed) captured or recovered into an output process stream (accepts). Recovery is calculated as a mass of x in the output stream per unit time divided by the mass of x in the input stream per the same time, and the fraction is multiplied by 100. Alternatively, the concentration of the component(s) of interest (defined as purity in Test Method E 889) are measured in all input and exit streams and used to calculate recovery.

3.1.10 *rejects*—the output stream(s) that have low concentrations of the component(s) of interest.

NOTE 1—In mass per time terms, $\text{Feed} = \text{Accepts} + \text{Rejects}$ for any conservation component if there is no storage term or loss of mass, for example, moisture.

3.1.11 *steady state operation*—a condition in which the materials separator is achieving a constant recovery performance over a given time.

4. Summary of Test Method

4.1 Percent recovery of a component can be calculated either by measuring the throughput of component x (mass per unit time) in the input (feed) and the throughput of component x in the output (accepts) process streams or by measuring the purity of the input and output streams.

4.1.1 The throughputs are measured as described in Test Method E 1107.

¹ This test method is under the jurisdiction of ASTM Committee D-34 on Waste Management and is the direct responsibility of Subcommittee D34.06 on Recovery and Reuse.

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² *Annual Book of ASTM Standards*, Vol 11.04.