



Designation: D5929 – 18

Standard Test Method for Determining Biodegradability of Materials Exposed to Source-Separated Organic Municipal Solid Waste Mesophilic Composting Conditions by Respirometry¹

This standard is issued under the fixed designation D5929; 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 biodegradation properties of a material by reproducibly exposing materials to conditions typical of source-separated organic municipal solid waste (MSW) composting. A material is composted under controlled conditions using a synthetic compost matrix and determining the acclimation time, cumulative oxygen uptake, cumulative carbon dioxide production, and percent of theoretical biodegradation over the period of the test. This test method does not establish the suitability of the composted product for any use.

1.2 This test is performed at mesophilic temperatures. Some municipal compost operations reach thermophilic temperatures during operation. Thermophilic temperatures can affect the biodegradation of some materials. This test is not intended to replicate conditions within municipal compost operations that reach thermophilic temperatures.

1.3 The values stated in both inch-pound and SI units are to be regarded separately as the standard. The values given in parentheses are for information only.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.03 on Treatment, Recovery and Reuse.

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2. Referenced Documents

2.1 ASTM Standards:²

D513 Test Methods for Total and Dissolved Carbon Dioxide in Water

D1129 Terminology Relating to Water

D1293 Test Methods for pH of Water

D2908 Practice for Measuring Volatile Organic Matter in Water by Aqueous-Injection Gas Chromatography

D6247 Test Method for Determination of Elemental Content of Polyolefins by Wavelength Dispersive X-ray Fluorescence Spectrometry

E1621 Guide for Elemental Analysis by Wavelength Dispersive X-Ray Fluorescence Spectrometry

2.2 APHA-AWWA-WEF Standard Method:³

2540G Total, Fixed, and Volatile Solids in Solid and Semi-solid Samples

3. Terminology

3.1 *Definitions*—Definitions of terms applying to this test method appear in Terminology D1129.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *acclimation time, n*—the time required for the oxygen uptake to reach 10 % of the total measured cumulative oxygen uptake.⁴

3.2.2 *inoculum, n*—a mixture of organic substances in varying degrees of biodegradation to provide microbial-rich substrate in which to perform biodegradation testing.

² 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.

³ Available from American Public Health Assoc., 1015 15th Street, NW, Washington, DC 20005, Standard Methods for the Examination of Water and Waste Water, 18th ed., 1992.

⁴ Tabak, H. H. and Lewis, R. F., "CEC/OECD Ring Test of Respiration Method for Determination of Biodegradability," U.S. Environmental Protection Agency, pp. 1–3.