Designation: D 5951 – 96

AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

Standard Practice for Preparing Residual Solids Obtained After Biodegradability Standard Methods for Plastics in Solid Waste for Toxicity and Compost Quality Testing[1]

This standard is issued under the fixed designation D 5951; 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 practice covers a standard procedure for preparing the residual solids obtained at the end of standard methods for biodegradability testing of plastics in solid waste, for subsequent toxicity and compost quality testing. The practice yields mixtures that can be used as such for terrestrial toxicity testing or that can be submitted to water extraction for further aquatic toxicity tests, in accordance with Practice D 5152, and in conjunction with Method D 4229, Guides E 729, E 1192, E 1295, and E 1440, or other currently accepted toxicity test methods (see OECD Guidelines 201, 202, 203, 207, and 208 or U.S. EPA 40FR797A, as well as other documents such as *A New Manual for Conducting Microtox Test with the Model 500 Analyzer*[2] the work on cyst-based toxicity tests by Centeno, et al[3]). The mixtures can also be used for further soil contact biodegradation testing.

1.2 This practice provides for storage and drying of the mixtures obtained at the end of the test methods for determination of the biodegradability of plastics under controlled composting conditions (Test Method D 5338), and under high-solids anaerobic digestion (Test Method D 5511). The mixtures contain the biologically decomposed residuals from solid waste and from the plastic materials. For the blanks, the residuals will be derived only from the biologically decomposed solid waste. In the event that a particular sample does not pass the toxicity test, chemical characterization of the degradation products can be performed on the sample to determine the source of the toxicity. Description of the performance of these analyses is beyond the scope of this practice.

1.3 There is no ISO standard that is equivalent to this practice.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *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 883 Terminology Relating to Plastics[4]

D 3987 Test Method for Shake Extraction of Solid Waste with Water[5]

D 4229 Method for Conducting Static Acute Toxicity Tests on Waste-Waters with Daphnia[6]

D 5152 Practice for Water Extraction of Residual Solids from Degraded Plastics for Toxicity Testing[7]

D 5338 Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions[7]

D 5511 Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under High-Solids Anaerobic-Digestion Conditions[7]

E 729 Guide for Conducting Acute Toxicity Tests with Fishes, Macroinvertebrates, and Amphibians[8]

E 1192 Guide for Conducting Acute Toxicity Tests on Aqueous Effluents with Fishes, Macroinvertebrates, and Amphibians[8]

E 1295 Guide for Conducting Three Brood, Renewal Toxicity Tests with Ceriodaphnia Dubia[8]

E 1440 Guide for an Acute Toxicity Test with the Rotifer Brachionus[8]

2.2 *OECD Guidelines:*[9]

OECD Guideline 201 Alga, Growth Inhibition Test

OECD Guideline 202 Daphnia sp., 14-day Reproduction Test

[1] This practice is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.96 on Environmentally Degradable Plastics.

Current edition approved May 10, 1996. Published July 1996.

[2] Microbics Corporation, Carlsbad, CA.

[3] Centeno, M. D., Brendonck, L., and Persoone, G., "Cyst-Based Toxicity Toxicity Tests III: Development and Standardization of an Acute Toxicity Test with the Freshwater Anostraean Crustacean Streptocephalus prosciceus," *Progress in Standardization of Aquatic Toxicity Tests*, A. M. V. M. Soares and P. Calow, eds., Lewis Publishers, London, United Kingdom, pp. 37–56.

[4] *Annual Book of ASTM Standards*, Vol 08.01.

[5] *Annual Book of ASTM Standards*, Vol 11.04.

[6] *Discontinued*—See 1987 *Annual Book of ASTM Standards*, Vol 11.04.

[7] *Annual Book of ASTM Standards*, Vol 08.03.

[8] *Annual Book of ASTM Standards*, Vol 11.05.

[9] Available from Director of Information, OECD, 2 rue André Pascal, 75775 Paris Cedex 16, France.