



Designation: ~~D6400-04~~ Designation: D6400 – 12

Standard Specification for Compostable Plastics Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities¹

This standard is issued under the fixed designation D6400; 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 specification covers plastics and products made from plastics that are designed to be composted in municipal and industrial aerobic composting facilities.~~

~~1.2 This specification is intended to establish the requirements for labeling of materials and products, including packaging made from plastics, as “compostable in municipal and industrial composting facilities.”~~

~~1.3 The properties in this specification are those required to determine if plastics and products made from plastics will compost satisfactorily, including biodegrading at a rate comparable to known compostable materials. Further, the properties in the specification are required to assure that the degradation of these materials will not diminish the value or utility of the compost resulting from the composting process.~~

~~1.1 This specification covers plastics and products made from plastics that are designed to be composted under aerobic conditions in municipal and industrial aerobic composting facilities, where thermophilic conditions are achieved.~~

~~1.2 This specification is intended to establish the requirements for labeling of materials and products, including packaging made from plastics, as “compostable in aerobic municipal and industrial composting facilities.”~~

~~1.3 The properties in this specification are those required to determine if end items (including packaging), which use plastics and polymers as coatings or binders will compost satisfactorily, in large scale aerobic municipal or industrial composting facilities. Maximum throughput is a high priority to composters and the intermediate stages of plastic disintegration and biodegradation not be visible to the end user for aesthetic reasons.~~

~~1.4 The following safety hazards caveat pertains to the test methods portion of this standard: *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 health and safety practices and to determine the applicability of regulatory limitations prior to use.*~~

~~NOTE 1—No equivalent ISO specifications exist for this standard.~~ 1—This test method is equivalent to ISO 17088.

2. Referenced Documents

2.1 ~~ASTM Standards:~~² www.astm.org/catalog/standards/sist/1267bdaa-25c0-43b3-8b07-48098a0dbe60/astm-d6400-12

D883 Terminology Relating to Plastics

D5338 ~~Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures~~

~~D6002 Guide for Assessing the Compostability of Environmentally Degradable Plastics—Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures~~

2.2 ~~Organization for Economic Development (OECD) Standard:~~³

OECD Guideline 208 ~~Terrestrial Plants, Growth Test—Terrestrial Plant Test: Seedling Emergence and Seedling Growth Test~~

2.3 ~~Comite Europeen de Normalisation (CEN):~~⁴ ~~EN 13432: 2000, 2000—CEN/TC 261/SC 4 N 99 Packaging—Requirements for Packaging Recoverable through Composting and Biodegradation—Test Scheme and Evaluation Criteria for the Final Acceptance of Packaging (EN 13432)~~

~~EN 13432 Requirements for Packaging Recoverable through Composting and Biodegradation—Test Scheme and Evaluation~~

¹ This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.96 on Environmentally Degradable Plastics and Biobased Products.

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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 Organization for Economic Development, Director of Information, 2 rue Andre' Pascal, 75775 Paris Cedex 16, France.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

*A Summary of Changes section appears at the end of this standard.

Criteria for the Final Acceptance of Packaging

EN 13432: 2000, 2000 CEN/TC 261/SC 4 N 99 Packaging—Requirements for Packaging Recoverable through Composting and Biodegradation—Test Scheme and Evaluation Criteria for the Final Acceptance of Packaging (EN 13432)

2.4 *ISO Standard*:⁴

ISO 14855 Evaluation of the Ultimate Aerobic Biodegradability and Disintegration of Plastics under Controlled Composting Conditions—Method by Analysis of Evolved Carbon Dioxide—ISO Standard:⁴

ISO 14855–1 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions—Method by analysis of evolved carbon dioxide—Part 1: General method

ISO 14855–2 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions—Method by analysis of evolved carbon dioxide—Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test

ISO 16929 Plastics—Determination of the Degree of Disintegration of Plastic Materials under Defined Composting Conditions in a Pilot-Scale Test—ISO 16929 Plastics—Determination of the Degree of Disintegration of Plastic Materials under Defined Composting Conditions in a Pilot-Scale Test

ISO 17088 Specifications for Compostable Plastics

ISO 20200 Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test

2.5 *U.S. Government Standard*:⁵

40 CFR Part 503.13 Standards for the Use or Disposal of Sewage Sludge

2.6 *Canadian Government Standard*:⁶

Trade Memorandum T-4-93 Standards for Metals in Fertilizers and Supplements

3. Terminology

3.1 *Definitions*:

3.1.1 *Definitions* Definitions appearing in this specification are found in Terminology D883, unless otherwise noted.

3.1.23.1.1 *biodegradable plastic*—a degradable plastic in which the degradation results from the action of naturally occurring microorganisms such as bacteria, fungi, and algae.

3.1.3

3.1.2 *compostable plastic*—a plastic that undergoes degradation by biological processes during composting to yield CO², water, inorganic compounds, and biomass at a rate consistent with other known compostable materials and leave no visible, distinguishable or toxic residue.

3.1.4

3.1.3 *composting*⁷—a managed process that controls the biological decomposition and transformation of biodegradable materials into a humus-like substance called compost: the aerobic mesophilic and thermophilic degradation of organic matter to make compost; the transformation of biologically decomposable material through a controlled process of biooxidation that proceed through mesophilic and thermophilic phases and results in the production of carbon dioxide, water, minerals, and stabilized organic matter (compost or humus).

3.1.4.1 *Discussion*—Composting uses a natural process to stabilize mixed decomposable organic material recovered from municipal solid waste, yard trimmings, biosolids (digested sewage sludge), certain industrial residues and commercial residues.

3.1.5

3.1.4 *degradable plastic*—a plastic designed to undergo a significant change in its chemical structure under specific environmental conditions, resulting in a loss of some properties that may be measured by standard test methods appropriate to the plastic and the application in a period of time that determines its classification.

3.1.6

3.1.5 *plastic*—a material that contains as an essential ingredient one or more organic polymeric substances of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or processing into finished articles, can be shaped by flow.

3.1.7

3.1.6 *polymer*—a substance consisting of molecules characterized by the repetition (neglecting ends, branch junctions, other minor irregularities) of one or more types of monomeric units.

4. Classification

4.1 The purpose of this specification is to establish standards for identifying products and materials that will compost satisfactorily in commercial and municipal composting facilities. Products meeting the requirements outlined below are appropriate for labeling as “compostable” in accordance with the guidelines issued by the Federal Trade Commission.

⁵ Code of Federal Regulations, available from U.S. Government Printing Office, Washington, DC 20402.

⁶ Available from the Canadian Food Inspections Agency, Fertilizer Section, Ottawa, Canada

⁷ Compost Facility Operating Guide, Composting Council, Alexandria, VA, 1995.