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Standard Specification for Biodegradable Plastics Used as Coatings on Paper and Other Compostable Substrates Labeling of End Items that Incorporate Plastics and Polymers as Coatings or Additives with Paper and Other Substrates Designed to be Aerobically Composted in Municipal or Industrial Facilities¹

This standard is issued under the fixed designation D6868; 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 biodegradable plastics and products (including packaging), where plastic film or sheet is attached (either through lamination or extrusion directly onto the paper) to substrates and the entire product or package is 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, using coatings of biodegradable plastics, as “compostable in municipal and industrial composting facilities.”~~

~~1.3 The properties in this specification are those required to determine if products (including packaging) using plastic films or sheets 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.~~

~~1.4 This standard does not describe contents or their performance with regard to compostability or biodegradability.~~

~~1.5~~

1.1 This specification covers end items that include plastics or polymers where plastic film/ sheet or polymers are incorporated (either through lamination, extrusion or mixing) to substrates and the entire end item is designed to be composted under aerobic conditions in municipal and industrial composting facilities, where thermophilic temperatures are achieved.

1.2 This specification is intended to establish the requirements for labeling of end items which use plastics or polymers as coatings or binders, 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 where maximum throughput is a high priority and where intermediate stages of plastic biodegradation should 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—There is no known ISO equivalent for this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

D883 [Terminology Relating to Plastics](#)

D3715/D3715M [Practice for Quality Assurance of Pressure-Sensitive Tapes](#)

D5338 [Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions](#)

D6002 [Guide for Assessing the Compostability of Environmentally Degradable Plastics](#)

D6400 [Specification for Compostable Plastics](#)—Specification for Compostable Plastics

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.

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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.

D6866 Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis

2.2 *Organization for Economic Development (OECD) Standard:*

OECD Guideline 208 Terrestrial Plants, Growth Test³

2.3 *Comite Europeen de Normalisation (CEN):*

EN 13432 Packaging-Requirements for Packaging Recoverable through Composting and Biodegradation-Test Scheme and Evaluation Criteria for the Final Acceptance of Packaging⁴

2.4 *ISO Standards:*⁴

ISO 14851 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium—Method by measuring the oxygen demand in a closed respirometer

ISO 14852 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium—Method by analysis of evolved carbon dioxide

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

ISO 16929 Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test

2.5 *Government Standard:*

40 CFR Part 503.13 Standards for the Use or Disposal of Sewage Sludge⁵

3. Terminology

3.1 ~~Definitions: Definitions-Definitions—Definitions~~ appearing in this specification are found in Terminology D883, unless otherwise noted:

~~3.1.1 biodegradable plastic—a degradable plastic in which the degradation results from the action of naturally occurring microorganisms such as bacteria, fungi, and algae.~~

~~3.1.2 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.~~

~~3.1.3 composting—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):~~

~~3.1.3.1 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.~~

~~3.1.4 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.~~

~~3.1.5 materials of natural origin—Chemically unmodified packaging materials and constituents of natural origin, such as wood, wood fibre, cotton fibre, starch, paper pulp or jute.~~

~~3.1.6 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 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., unless otherwise noted.~~

3.2 Definitions of Terms Specific to This Standard:

3.2.1 materials of natural origin, n—Chemically unmodified ligno-cellulosic packaging materials and constituents of natural origin, such as wood, wood fibre, cotton fibre, starch, paper pulp or jute.

3.3 Definition found in Terminology Practice D3715/D3715M:

3.3.1 end item—the actual product or commodity being sold under the material specification. It is in its most complete form and may be either packed for shipping or at a production stage just preceding packing.

4. Classification

4.1 The purpose of this specification is to establish standards for identifying products and materials, where biodegradable plastic

³ Available from Organization for Economic Development, Director of Information, 2 rue Andre Pascal, 75775 Paris Cedex 16, France.

³ Available from Organisation for Economic Cooperation and Development (OECD), 2 rue André Pascal, F-75775, Paris Cedex 16, France, <http://www.oecd.org>.

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

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

⁵ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.