

BELIZE STANDARD

BZS 32: 2021

BELIZE STANDARD FOR BIODEGRADABLE PRODUCTS – SPECIFICATION AND LABELLING

**BBS
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BIODEGRADABLE PRODUCTS – SPECIFICATION AND LABELLING

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0 FOREWORD

- 0.1** The phase-out of single-use disposable plastic bags, single use disposable “styrofoam” and “plastic” food containers and utensils in Belize was approved by Cabinet on 20 March 2018 which required the amendment to the Pollution Regulation.
- 0.2** The amendment to the Pollution Regulation is aimed at reducing and preventing pollution to the Belizean environment from plastics and styrofoam through the regulation of importation, production, manufacturing, use and sale of single-use plastics. Pollution from plastics impacts the marine and terrestrial environment and has become a major problem in Belize.
- 0.3** This standard was developed to address specification and labelling of biodegradable products imported, distributed, manufactured or sold in Belize.
- 0.4** This standard is intended to be established as a mandatory standard to support the enforcement of the Regulation primarily through recognized independent third-party certification.
- 0.5** Improvement in awareness and education on the proper use and waste management of all plastics including biodegradable plastics should be supported and promoted.
- 0.6** In preparing this draft, assistance was received from the following documents:
- a) EN 13432: 2000 – Requirements for packaging recoverable through composting and biodegradation – test scheme and evaluation criteria for the final acceptance of packaging.
 - b) ASTM D6868-19 – Standard Specification for 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 Facilities

1 SCOPE

- 1.1** This standard specifies minimum requirements, test methods and labelling of commercially biodegradable, commercially compostable, anaerobically biodegradable or environmentally biodegradable (soil, water, landfill, etc.) plastics manufactured in or imported into Belize.

1.2 This standard applies to products specified in the regulation, single use commercially biodegradable, commercially compostable, or environmentally biodegradable plastic products namely:

- c) bags referred to as carrier bags, “plastic shopping bags”; and
- d) food containers and utensils such as bowls, clamshells, cups, forks, knives, lids, plates, soup cups, spoons, straws, trays, etc.

2 NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- a) BZS 1: Part 2 - Belize Standard Specification for Labelling Part 2: Labelling of Prepackaged Goods
- b) ISO 16929:2013 - Plastics - Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test
- c) ISO 20200:2015 - Plastics - Determination of the degree of disintegration of plastic materials under simulated composting conditions in a laboratory-scale test
- d) ISO 14855-1:2005 - Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide - Part 1: General method.
- e) 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.
- f) ASTM D5338 - Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials under Controlled Composting Conditions
- g) ASTM D5988-18 - Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in Soil
- h) ASTM D6400-19 - Standard Specification for Labelling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities.
- i) EN 14995 - Plastics – Evaluation of compostability – test scheme and specifications.

3 DEFINITION OF TERMS

For the purpose of this standard, the definitions of Belize Standard BZS 36: 2020 - Definitions of Terms Used in the Biodegradable Products Industry shall apply.

4 GENERAL REQUIREMENTS

4.1 Characterization

Characterization is the determination of the constituents of plastics. This is important because some constituents can be harmful to the environment.

4.2 Criteria

Each plastic under investigation shall be identified and characterized prior to testing as follows:

- e) The information about the identification of each component of the plastic (e.g. thickness) shall be determined and recorded.
- f) The biobased carbon content and total dry solids of the plastic shall be determined and recorded.
- g) The thickness of the plastic product shall be determined and recorded.
- h) The colour constituents of the plastic product shall be determined and recorded.
- i) FTIR or another spectroscopic scan.

NOTE: Colourants can affect the outcomes of test and in particular - ecotoxicity.

5 SPECIFIC REQUIREMENTS

5.1 General

- a) Biodegradability shall be determined for constituents of the plastic including dyes, inks and colours in accordance with ASTM D6400, D6868 and EN 13432.

5.2 Compostability

In order to compost satisfactorily, a plastic product or material shall demonstrate each of the characteristics below:

- a) Disintegration During Composting - a plastic product or material will disintegrate during composting such that any remaining plastic residuals are not readily distinguishable from the other organic materials in the finished product. Additionally, the material or product must not be found in significant quantities during screening prior to final distribution of the compost.

5.3 Disintegration

- a) When testing finished articles and products, testing shall be conducted starting with the articles and products in the same form as they are intended to be used. For products and materials that are made in several different

thicknesses or densities, such as films, containers and foams, only the thickest or most dense products and materials need to be tested providing the chemical composition and structure remains otherwise the same.

- b) It shall be demonstrated that a disintegration of the test material to $\geq 90\%$ is achieved within the specified treatment time of 180 days.
- c) When tests on ecotoxicity are performed it is important to use compost from disintegration tests that have been run with and without the test material to compare the test results directly and to find out any relative ecotoxic effects.
- d) Special attention should be given to the visual aspects of compost.

NOTE 1: The compost generated from the disintegration test may be used for assessment of compost quality.

NOTE 2: If the compost quality of the product has already been assessed under AS 4736, the result from AS 4736 can be used to meet ecotoxicity criteria.

NOTE 3: Two evaluative methods are available for assessment of disintegration. If a product is to be tested only for disintegration, either ISO 20200 or a slide frame test may be used. If a product is to be tested for disintegration and ecotoxicity in one test series, it is necessary to use the method as outlined in ISO 20200.

- e) Biodegradation - A level of biodegradation for the plastic products shall be established by tests under controlled conditions.
- f) No Adverse Impacts on Ability of Compost to Support Plant Growth - the tested materials shall not adversely impact on the ability of composts to support plant growth, when compared to composts derived from biowaste without any addition of tested products or reference materials. Additionally, the polymeric products or materials must not introduce unacceptable levels of regulated metals or hazardous substances (see section 6).
- g) In order to be identified as compostable in municipal or industrial aerobic facilities, products must pass the requirements as stated in table 2 using the appropriate laboratory tests, representative of the conditions found in aerobic composting facilities, which reach thermophilic temperatures. Finished articles and products shall be tested in the same form as they are intended to be used. For products that are made in multiple thicknesses or densities, such as films, containers and foams, only the thickest or most dense products need to be tested as long as the chemical composition and structure remains otherwise the same. It is assumed that thinner gages and lower densities will also compost satisfactorily. Similarly, if additives are present in test samples that pass testing, lower levels of the same additives are similarly passed.

Table 1: Test Methods for Municipal or Industrial Aerobic Facilities Compostable Products

Characteristic(s)	Control	Test Method(s)
Disintegration During Composting	A plastic product is considered to have demonstrated satisfactory disintegration if after twelve weeks (84 days) in a controlled composting test, no more than 10 % of its original dry weight remains after sieving on a 2.0-mm sieve.	ISO 16929 with a minimum vessel volume of 35 L, or ISO 20200 under thermophilic aerobic composting conditions
Biodegradation	A plastic product must demonstrate a satisfactory rate of biodegradation by achieving the following ratio of conversion to carbon dioxide* within 365 days	ASTM D5338, ISO 14855-1, or ISO 14855-2.
<p>* ninety percent (90%) of the organic carbon in the whole item of for each organic constituent, which is present in the material at a concentration of more than 1% (by dry mass), shall be converted to carbon dioxide by the end of the test period when compared to the positive control or in the absolute</p> <ul style="list-style-type: none"> - organic constituents present at levels between 1 to 10% shall be tested individually for compliance to the above carbon dioxide conversion ratio. - organic constituents present at less than 1% do not need to demonstrate biodegradability. However, the sum of such unproven constituents shall not exceed 5%. 		

5.3.1 Criteria

When tested to ISO 20200 as modified by Clause 5.5.3 below, a plastic product shall be considered to have demonstrated satisfactory disintegration if, after 180 days in a controlled composting test, no more than 10% w/w (dry weight) of the original dry weight of test material fails to pass through a 2 mm fraction sieve. (or as stipulated in the regulation)

5.3.2 Test method

- a) For measurement of the degree of disintegration, ISO 20200 shall be used with the following modification:
 - i. the test duration shall be 180 days.
- b) For measurement of the degree of disintegration and ecotoxicity in one test series, ISO 20200 shall be used, with the following modification:
 - ii. the plastic sample shall be added to the biowaste in a concentration of 10% (wet weight basis) before starting the compost process.

5.4 Biodegradability (Aerobic and Anaerobic) Criteria

- a) Test samples shall not be subjected to conditions that will accelerate biodegradation prior to testing.
- b) The test sample shall degrade at least 90% w/w (dry weight) in total or equal to the maximum degradation of a suitable reference substance. The maximum percentage biodegradation of the reference substance shall only be obtained after a plateau has been reached in the rate of biodegradation or is considered

to be the percent biodegradation obtained after the testing period is completed.

- c) The ultimate aerobic biodegradability shall be determined for the whole material or for each organic constituent that is present in the material at a concentration of more than 1% (by dry mass). Constituents that are present at concentrations of less than 1% do not need to demonstrate biodegradability. However, the sum of such constituents shall not exceed 5%.

5.4.1 Test method

The limit value for biodegradation is based on conversion of the carbon of the test material into carbon dioxide and biomass along with methane for anaerobic biodegradation. The details of calculation depend on the test and analytical methods used such as ASTM D5338, ASTM D5988, or any other recognized test which meets the criteria.

6 SAFETY REQUIREMENTS

The final product shall be safe and of food grade quality which shall be determined by manufacturer.

6.1 Heavy Metals

The presence of heavy metals and other toxic and hazardous substances shall be determined and recorded. The concentration of any constituent present in a plastic shall not exceed the value given in EN 14995 given in the table below.

Table 2: Maximum Limits for Heavy Metals and other substances

Element	mg/kg on dry substance	Element	mg/kg on dry substance
Zn	150	Cr	50
Cu	50	Mo	1
Ni	25,0	Se	0,75
Cd	0,5	As	5
Pb	50	F	100
Hg	0,5		

6.2 Plant Toxicity

Any toxicity effect of biodegraded metabolites of plastics can have an adverse effect on plant germination and plant growth. Therefore, it is necessary to assess any such effects on those species due to the presence of residual plastic species and metabolites. Ecotoxic effects shall be determined by EN 13432 Appendix E.

7 PACKAGING AND LABELLING REQUIREMENTS

7.1 Labelling requirements

All biodegradable food containers manufactured, imported, sold or offered for sale shall comply with the **Belize Standard - BZS 1: Specification for Labelling Part 2: Labelling of Prepackaged Goods**'. In addition, the labels shall comply with the following requirements:

- a) material composition - raw materials used for container shall be safe and of food grade quality.
- b) time to biodegrade - the time to biodegrade shall not exceed twelve (12) months as per specified testing conditions.
- c) characterization/grading.

NOTE 1: Preference is made for the use of Best-by-Date to comply with date marking requirements.

NOTE 2: Requirements for instructions for use shall consider safety precautions as well.

- d) percentage of biobased carbon content.

7.2 Optional Labelling

- a) certification marks - the use of biodegradable and compostable certification marks shall be approved by the Belize Bureau of Standards.
- b) microwavable properties - there shall be an indication as to whether the container is microwavable or not.
- c) registration and identification marks.
- d) purpose or use.
- e) storage conditions.

7.3 Environmental claims

An environmental claim that is vague or non-specific or which broadly implies that a product is environmentally beneficial or environmentally benign shall not be used. Therefore, environmental claims such as “environmentally safe”, “environmentally friendly”, “earth friendly”, “non-polluting”, “green”, “nature’s friend”, “ozone friendly, ecological” shall not be used.

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