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BSI Standards Publication

Plastics — Template for reporting and communication of bio-based carbon content and recovery options of biopolymers and bioplastics — Data sheet

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Plastics - Template for reporting and communication of bio-based carbon content and recovery options of biopolymers and bioplastics - Data sheet

Plastiques - Modèle pour le rapport et la communication de la teneur en carbone biosourcé et des options de valorisations des biopolymères et bioplastiques - Fiche technique

Kunststoffe - Vorlage für die Angabe des Gehaltes an biobasiertem Kohlenstoff und der Verwertungsmöglichkeiten für Biopolymere und Biokunststoffe - Datenblatt

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Foreword

This document (CEN/TS 16398:2012) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

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Introduction

CEN/TR 15932 [1] gives recommendations for the terminology and the characterisation of biopolymers and bioplastics.

Biopolymers and bioplastics can be either bio-based (based on biomass) or biodegradable in industrial composting plants, or both. Furthermore, in the biomedical sector the terms biopolymer and bioplastic mainly refer to the biological compatibility with living tissues. As a consequence, the terms "biopolymer" and "bioplastic" can identify products with very different characteristics.

The different characteristics which relate to the “bio-“prefix can thus be a potential source of confusion as recognised by CEN/TR 15392. As the result of chemical modifications or the combination with non-biodegradable parts, the biodegradable nature of the original biological raw material can be lost in the final biopolymer rendering it non-biodegradable. This is a potential problem especially for disposable products as the end-user may mistake bio-based for biodegradable products and vice-versa.

The terms biopolymer and bioplastic are not exhaustive and more detailed information needs to be declared in order to better specify the real nature and properties of each biopolymer or bioplastic.

1 Scope

This Technical Specification specifies a template for reporting and communication of characteristics covering bio-based carbon content and recovery options (i.e. organic recycling, material recycling and energy recovery) of a given item in commercial business-to-business transactions by means of a specific data sheet for biopolymers and bioplastics. This Technical Specification also gives the relevant methods for the evaluation and verification of the claims.

This Technical Specification provides the principles and requirements for the communication of selected claims in the field of environmental performance and characteristics to be used with reference to items such as biopolymers, bioplastic materials, semi-finished bioplastic products and finished bioplastic products, including composites, before it is available to the end-user or consumer.

This Technical Specification is not intended for use in communicating biobased-content and recovery options in business to consumer communications

Biocompatible polymers and plastics for medical applications, covered by specific provisions, are out of the scope of this document.

NOTE This Technical Specification does not override, or in any way change, legally required information, claims or labelling, or any other applicable legal requirements.

2 Normative references

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

EN 13431, *Packaging — Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value*

EN 13432, *Packaging — Requirements for packaging recoverable through composting and biodegradation — Test scheme and evaluation criteria for the final acceptance of packaging*

EN 14995, *Plastics — Evaluation of compostability — Test scheme and specifications*

CEN/TS 16137, *Plastics — Determination of the bio-based carbon content*

CEN/TS 16295, *Plastics — Declaration of the bio-based carbon content*

EN ISO 14020:2001, *Environmental labels and declarations — General principles (ISO 14020:2000)*

EN ISO 14021:2001, *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling) (ISO 14021:1999)*

ISO 1928, *Solid mineral fuels — Determination of gross calorific value by the bomb calorimetric method, and calculation of net calorific value*

ISO 15270:2008, *Plastics — Guidelines for the recovery and recycling of plastics waste*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15270:2008 and the following apply.

3.1
bio-based carbon content
amount of carbon in a sample that is of recent origin, as evidenced by its ^{14}C isotope content

[SOURCE: CEN/TR 15932:2010]

Note 1 to entry: The amount of bio-based carbon in a material or product is often expressed as a percent of the weight (mass) of the total organic carbon of this material or product.

3.2
biomass
material of biological origin excluding material embedded in geological formation or fossilised

[SOURCE: CEN/TR 15932:2010]

3.3
biomass content
mass fraction of bio-based material in a sample

Note 1 to entry: Claims of biomass content are difficult to verify due to lack of standards.

[SOURCE: CEN/TR 15932:2010]

3.4
bio-based plastic
plastic in which constitutional units are totally or in part from biomass origin

3.5
bio-based polymer
polymer in which constitutional units are totally or in part from biomass origin

[SOURCE: CEN/TR 15932:2010]

Note 1 to entry: The terms biosourced, biogenic, biomass-based, and renewable based are often used as equivalent to bio-based by different communication media.

3.6
business-to-consumer transaction
transaction that occurs between a company and a consumer, as opposed to a transaction between companies

Note 1 to entry: The term may also describe a company that provides goods or services for consumers.

3.7
business-to-business transaction
transaction that occurs between a company and another company, as opposed to a transaction involving a consumer

Note 1 to entry: The term may also describe a company that provides goods or services for another company.

4 Claims on biopolymers and bioplastics

Several and different claims may be used in order to communicate the characteristics of biopolymers and bioplastics. The objective of this Technical Specification is to harmonise the use of some claims specified in Clause 6, which are essential to describe biopolymers and bioplastics.

5 Evaluation and verification of the claims

The evaluation and verification of the claims shall be in accordance with the principles given in EN ISO 14020:2001 and EN ISO 14021:2001, as follows:

a) Principle 1: environmental labels and declarations shall be accurate, verifiable, relevant and not misleading.

b) Principle 2: procedures and requirements for environmental labels and declarations shall not be prepared, adopted, or applied with a view to, or with the effect of, creating unnecessary obstacles to international trade.

c) Principle 3: environmental labels and declarations shall be based on scientific methodology that is sufficiently thorough and comprehensive to support the claim and that produces results that are accurate and reproducible.

d) Principle 4: information concerning the procedure, methodology, and any criteria used to support environmental labels and declarations shall be available and provided upon request to all interested parties.

e) Principle 5: the development of environmental labels and declarations shall take into consideration all relevant aspects of the life cycle of the product.

f) Principle 6: environmental labels and declarations shall not inhibit innovation which maintains or has the potential to improve environmental performance.

g) Principle 7: any administrative requirements or information demands related to environmental labels and declarations shall be limited to those necessary to establish conformance with applicable criteria and standards of the labels and declarations.

h) Principle 8: the process of developing environmental labels and declarations should include an open, participatory consultation with interested parties. Reasonable efforts should be made to achieve a consensus throughout the process.

i) Principle 9: information on the environmental aspects of products and services relevant to an environmental label or declaration shall be available to purchasers and potential purchasers from the party making the environmental label or declaration.

6 Data sheet for biopolymers and bioplastics

6.1 General rules

The claims of the characteristics of the biopolymers or bioplastics shall be provided by using a template, as shown in Annex A. This template includes three parts:

a) identification of the plastic item;

b) bio-based carbon content;

c) recovery options.

Unless otherwise indicated in the template, every field shall be filled in. If information is not available or not relevant for the intended uses, an appropriate rationale shall be included.

NOTE For some items the requested information may be not relevant, e.g. the compostability for durable products, e.g. construction products.

6.2 Plastic item identification

6.2.1 Material/product designation

This information is needed in order to unequivocally identify the material/product (e.g. trademark, grade, reference, etc.).

6.2.2 Producer/manufacturer identification

This information is needed in order to unequivocally identify the producer/manufacturer. The registered office address of the producer/manufacturer shall be provided, if different.

6.2.3 Intended end uses

The intended end use sector and application shall be provided.

EXAMPLES "Agriculture/mulch films", "construction/insulation panels", "packaging/bottles", "tableware/ drinking cup", “automotive/fluid transfer lines”.

The application may also be characterised and indicated as durable or disposable.

6.3 Bio-based carbon content

The bio-based carbon content, determined in accordance with CEN/TS 16137, shall be declared according to CEN/TS 16295.

6.4 Recovery options

6.4.1 Organic recyclability (biodegradability and compostability)

If relevant, the biodegradability and compostability of biopolymers and bioplastics should be evaluated in accordance with EN 14995 or EN 13432, as applicable.

The suitability of an item for organic recycling is dependent on its thickness. The maximum value of the thickness for which all the criteria of organic recycling are satisfied shall be given in the data sheet.

This information is essential for the suitability of items made from biopolymers or bioplastics intended for organic recycling in industrial or municipal plants.

6.4.2 Identification coding for material recycling

The success of a plastic recycling process is largely based on the ability to correctly separate the different plastic materials, which are generally not compatible which each other. In order not to cross-contaminate plastic waste items made from biopolymers and bioplastics shall be suitably identified. Means of identification of materials are provided by EN ISO 1043 [2], EN ISO 11469 [3], SPI resin identification coding system [4] or the Commission decision 97/129/EC [5].

6.4.3 Energy recoverability

Items made from biopolymers or bioplastics can be recovered by means of incineration with energy recovery, part of which may be renewable energy.

EN 13431 specifies the requirements for a packaging to be classified as recoverable in the form of energy and sets out procedures for assessment of conformity with those requirements.

The provisions of EN 13431 may be extended to any item within the scope of this Technical Specification for determining the inferior calorific value q_{net}, expressed in megajoules per kilogram (MJ/kg), according to ISO 1928. This data is essential to verify the compliance to EN 13431 and may be indicated in the data sheet.

According to EN 13431, to claim energy recovery option, the inferior calorific value q_{net} shall be equal to or greater than 5 MJ/kg.

6.4.4 Additional information

This is an optional field that may contain any additional information which is considered as relevant and useful by the producer/manufacturer for a better understanding of the content of the data sheet, e.g. the reference(s) to certification schemes.

Annex A
(normative)

Template for a "Data sheet for biopolymers and bioplastics items"

IDENTIFICATION OF THE PLASTIC ITEM	
Material/product designation (e.g. trademark, grade, reference, etc.)	
Producer/manufacturer identification (name and address)	
Intended end uses (industrial sector and/or intended application)	
BIO-BASED CARBON CONTENT	
Bio-based carbon content (%) according to CEN/TS 16295 Otherwise: “not determined“ or “not relevant” (including a justification)	
RECOVERY OPTIONS	
Organic recycling in industrial or municipal plants, according to EN 14995 or EN 13432 Maximum thickness of the item for which the compostability criteria are satisfied Otherwise: “not determined“ or “not relevant for the intended end uses” (including a justification)	
Identification coding for material recycling (i.e. the identification system) Otherwise: “not relevant for the intended end uses” (including a justification)	
Energy recovery Inferior calorific value q_{net} (MJ/kg), according to EN 13431 Otherwise: “not determined” or “not relevant for the intended end uses” (including a justification)	
Additional information	
ISSUED BY:……IN COMPLIANCE WITH CEN/TS 16398 DATE:…… CERTIFIED BY: (if applicable):……	

Annex B
(informative)

Examples of data sheets

NOTE The trademarks and names of companies given in the following examples were invented and any relation to trademarks or names of companies would be purely by chance.

B.1 Example 1

Partly bio-based polyurethane foam to be used to manufacture mattresses

IDENTIFICATION OF THE PLASTIC ITEM	
Material/product designation (e.g. trademark, grade, reference, etc.)	AnyCofoam Grade XY 001
Producer/manufacturer identification (name and address)	AnyCo Ltd, PO Box 21 B-1050 Brussels
Intended end uses (industrial sector and/or intended application)	Stuffing of furniture, padding, etc.
BIO-BASED CARBON CONTENT	
Bio-based carbon content (%) according to CEN/TS 16295 Otherwise: “not determined“ or “not relevant” (including a justification)	35 %
RECOVERY OPTIONS	
Organic recycling in industrial or municipal plants, according to EN 14995 or EN 13432 Maximum thickness of the item for which the compostability criteria are satisfied Otherwise: “not determined“ or “not relevant for the intended end uses” (including a justification)	Not relevant for the intended end uses: biodegradability is not a desired characteristic and organic recycling is not a suitable end-of-life option for the intended products.
Identification coding for material recycling (i.e. the identification system) Otherwise: “not relevant for the intended end uses” (including a justification)	PUR (EN ISO 1043-1)
Energy recovery Inferior calorific value q_{net} (MJ/kg), according to EN 13431 Otherwise: “not determined” or “not relevant for the intended end uses” (including a justification)	Not determined (to be measured in the future)
Additional information	
ISSUED BY:……IN COMPLIANCE WITH CEN/TS 16398 DATE: 2011 05 31 CERTIFIED BY: (if applicable):……	

B.2 Example 2

A partly biobased plastic material to be used to manufacture compostable waste bags.

IDENTIFICATION OF THE PLASTIC ITEM	
Material/product designation (e.g. trademark, grade, reference, etc.)	AnyCofilm Type XY 001
Producer/manufacturer identification (name and address)	AnyCo Ltd, PO Box 21 B-1050 Brussels
Intended end uses (industrial sector and/or intended application)	Waste bags, etc.
BIO-BASED CARBON CONTENT	
Bio-based carbon content (%) according to CEN/TS 16295 Otherwise: “not determined“ or “not relevant” (including a justification)	60 %
RECOVERY OPTIONS	
Organic recycling in industrial or municipal plants, according to EN 14995 or EN 13432 Maximum thickness of the item for which the compostability criteria are satisfied Otherwise: “not determined“ or “not relevant for the intended end uses” (including a justification)	Yes, maximum thickness of films: 100 µm
Identification coding for material recycling (i.e. the identification system) Otherwise: “not relevant for the intended end uses” (including a justification)	Not relevant for the intended end uses Products are assumed to be treated by organic recycling. Mechanical recycling is not the intended end-of-life option.
Energy recovery Inferior calorific value q_{net} (MJ/kg), according to EN 13431 Otherwise: “not determined” or “not relevant for the intended end uses” (including a justification)	12 MJ/kg
Additional information	
ISSUED BY:……IN COMPLIANCE WITH CEN/TS 16398 DATE:……. CERTIFIED BY: (if applicable):……	

B.3 Example 3

A biobased plastic material to be used to manufacture cosmetics bottles.

IDENTIFICATION OF THE PLASTIC ITEM	
Material/product designation (e.g. trademark, grade, reference, etc.)	AnyCobottle Grade XY 001
Producer/manufacturer identification (name and address)	AnyCo Ltd, PO Box 21 B-1050 Brussels
Intended end uses (industrial sector and/or intended application)	Cosmetics bottles, etc.
BIO-BASED CARBON CONTENT	
Bio-based carbon content (%) according to CEN/TS 16295 Otherwise: “not determined“ or “not relevant” (including a justification)	100 %
RECOVERY OPTIONS	
Organic recycling in industrial or municipal plants, according to EN 14995 or EN 13432 Maximum thickness of the item for which the compostability criteria are satisfied Otherwise: “not determined“ or “not relevant for the intended end uses” (including a justification)	Not relevant for the intended end uses Final packaging not designed for biodegradation and not intended for organic recycling.
Identification coding for material recycling (i.e. the identification system) Otherwise: “not relevant for the intended end uses” (including a justification)	
Energy recovery Inferior calorific value q_{net} (MJ/kg), according to EN 13431 Otherwise: “not determined” or “not relevant for the intended end uses” (including a justification)	12 MJ/kg
Additional information	
ISSUED BY:……IN COMPLIANCE WITH CEN/TS 16398 DATE:…… CERTIFIED BY: (if applicable):……	

Bibliography

[1] CEN/TR 15932:2010, *Plastics — Recommendation for terminology and characterisation of biopolymers and bioplastics*

[2] EN ISO 1043 (all parts), *Plastics — Symbols and abbreviated terms*

[3] EN ISO 11469, *Plastics — Generic identification and marking of plastics products (ISO 11469)*

[4] SPI resin identification coding system, of the Plastics Industry Trade association

[5] Commission Decision of 28 January 1997 establishing the identification system for packaging materials pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste (97/129/EC)

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