



SLOVENSKI STANDARD
SIST-TS CEN/TS 16295:2012
01-maj-2012

Polimerni materiali - Izjava o deležu ogljika biološkega izvora

Plastics - Declaration of the bio-based carbon content

Kunststoffe - Deklaration des Gehaltes an biobasiertem Kohlenstoff

Plastiques - Déclaration de la teneur en carbone biosourcé

Ta slovenski standard je istoveten z: CEN/TS 16295:2012

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ICS:

83.080.01	Polimerni materiali na splošno	Plastics in general
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English Version

Plastics - Declaration of the bio-based carbon content

Plastiques - Déclaration de la teneur en carbone biosourcé

Kunststoffe - Deklaration des Gehaltes an biobasiertem Kohlenstoff

This Technical Specification (CEN/TS) was approved by CEN on 20 September 2011 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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Foreword

This document (CEN/TS 16295:2012) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

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Introduction

Development of bio-based materials is considered to be an important prospect for Europe. This development finds its value in the strategic use of resources, in the effort to shift from fossil resources (under depletion conditions and imported from the global market) to bio-based resources (renewable and sourced in the domestic market) and in the attempt of reducing the environmental impact of materials and products. Efficient use of all available resources and responsible utilization of renewable carbon is a way to participate to this reduction. It is also important to underline that available resources should be preferred also taking into consideration sustainability and environmental impacts following the life cycle thinking approach. Generally speaking, the biological origin of a material does not provide a certainty that the material is of low environmental impact.

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

The bio-based polymers represent a relevant growing industrial sector. Bio-based polymers are, totally or partially, based on biomass, namely recently fixed organic matter.

In order to inform users, customers and stakeholders with a transparent and reliable communication about bio-based polymers, it is important to point out, quantify, and declare the bio-based carbon content.

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1 Scope

This Technical Specification provides requirements for the declaration, including statements and labels, of the bio-based carbon content of items, such as polymers, plastic materials, semi-finished plastic products and finished plastic products, including composites.

NOTE 1 This document does not override, or in any way change, legally required environmental information, claims or labelling, or any other applicable legal requirements.

NOTE 2 This document addresses the bio-based content of plastic items, expressed as a fraction of the total organic carbon content. The declaration of biomass content, i.e. the total amount of raw materials of biogenic origin contained in a plastics item, expressed as a percentage of the total mass, is out of scope of this document, as there is currently no well established method to determine the biomass content of polymers or plastics materials.

NOTE 3 Since bio-based polymers can be biodegradable or non-biodegradable, and the origin of the materials renewable or non-renewable, (see CEN/TR 15932), the declaration of the bio-based carbon content is not an indication of the biodegradability of an item.

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.

CEN/TS 16137:2011, *Plastics — Determination of the bio-based carbon content*

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

biomass

material of biological origin excluding material embedded in geological formation or fossilized

[Source: CEN/TR 15932:2010]

3.2

bio-based

derived from biomass

[Source: CEN/TR 15932:2010]

3.3

bio-based polymer

polymer in which constitutional units are totally or in part from biomass origin

[Source: CEN/TR 15932:2010]

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- 3.4**
bio-based carbon content
amount of carbon in a sample that is of recent origin, as evidenced by its ¹⁴C isotope content
- [Source: CEN/TR 15932:2010]
- 3.5**
total carbon
TC
quantity of carbon present in a material or an article in the form of organic, inorganic and elemental carbon
- 3.6**
total organic carbon
TOC
quantity of carbon that is converted into carbon dioxide by combustion and which is not liberated as carbon dioxide by acid treatment
- [Source: EN 13137:2001]
- 3.7**
constituent of a plastics material
chemical material and substance which a plastics material is composed of
- 3.8**
component
part of product that can be separated by hand or by using simple physical means
- 3.9**
composite
solid product consisting of two or more distinct phases, including a binding material (matrix) and a particulate or fibrous material
- 3.10**
multilayer product
product consisting of two or more layers of plastic film or sheet, cellular plastic material, metal, wood or composite with or without adhesive interlayer(s)
- 3.11**
multi-material
material made of more than one material

Note 1 to entry: A multi-material item may be e.g. a composite or a multilayer product.

- 3.12**
integrated component
part of a product that can be easily differentiated but not easily separated by hand or by using simple physical means

4 Symbols and abbreviations**4.1 Symbols**

x^{TOC} total organic carbon content, expressed as a percentage of the mass of the sample

x_B^{TOC} bio-based carbon content by total organic carbon content, expressed as a percentage of the total organic carbon content

4.2 Abbreviations

TOC total organic carbon

5 Determination of the bio-based carbon content

The polymer or plastic material/product shall be characterised in terms of percentage of the bio-based carbon, expressed as a fraction of the total organic carbon content (x_B^{TOC}). The bio-based carbon content of the polymer or plastic/product shall be determined according to CEN/TS 16137 provided that the minimum total organic carbon content is 5 %.

NOTE CEN/TS 16137:2011 is technically equivalent to ASTM D 6866-11 [2]. Though Method A (PSM) of CEN/TS 16137:2011 is deleted in ASTM D 6866 11 [2], the test results obtained by CEN/TS 16137:2011, Method A, are considered to be reliable provided that the bio-based carbon content has been determined for an item with a high carbon fraction.

This document does not take into consideration the content of inorganic carbon (e.g. fillers) which contributes to the total carbon content of the polymer or plastic material and to fossil CO₂ release in case of incineration.

The bio-based carbon content of the item shall be either determined by testing the item or calculation according to Equation (1) provided that the bio-based carbon content of each constituent/component have been determined according to CEN/TS 16137.

$$x_B^{TOC} item = \frac{\sum (w_i \times x_B^{TOC} i \times x_i^{TOC})}{\sum (w_i \times x_i^{TOC})} \quad (1)$$

where

- $x_B^{TOC} item$ is the bio-based carbon content by total organic carbon content of the item, expressed as a percentage of the total organic carbon content of the item;
- $x_B^{TOC} i$ is the bio-based carbon content by total organic carbon content of the constituent/component (i), expressed as a percentage of the total organic carbon content;
- w_i is the dry mass fraction of the constituent/component (i), expressed as a percentage of the total mass of the item;
- x_i^{TOC} is the total organic carbon content of the constituent/component (i), expressed as a percentage of the mass of the constituent/component (i).

If other constituents, which were not present in the original polymer/material, are used to manufacture the item, then the polymer or material shall be considered as a new polymer or material whose bio-based carbon content shall be either measured or calculated according to Equation (1).

This requirement does not apply if the extra-constituents are below 3 % in mass of the original labelled polymer/plastic material. The extra-constituents are counted as non-bio-based. This exception may apply e.g., when a final product is printed and coloured.

When they are used as constituents of plastic items, the substances and materials obtained from renewable resources, such as lignocellulosic materials (e.g. wood, straw, natural fibres), polysaccharides (e.g. starch, cellulose), vegetable and animal fats, oils and waxes, and fatty acids from C6 to C24 (and their potassium, sodium, calcium and magnesium salts) and glycerol obtained from the above mentioned fatty acids and oils by hydrolytic process, with no further chemical modification, shall be considered as totally bio-based