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Plastics — Biobased content —

Part 5: Declaration of biobased carbon content, biobased synthetic polymer content and biobased mass content

Plastiques — Teneur biosourcée —

Partie 5: Déclaration de la teneur en carbone biosourcé, de la teneur en polymère synthétique biosourcé et de la teneur en masse biosourcée

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see http://www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

A list of all parts in the ISO 16620 series can be found on the ISO website.

Introduction

Increased use of biomass resources for manufacturing plastic products is effective for reducing global warming and the depletion of fossil resources.

Current plastic products are composed of biobased synthetic polymers, fossil-based synthetic polymers, natural polymers and additives that can include biobased materials.

“Biobased plastics” refers to plastics that contain materials wholly or partly of biogenic origin.

In the ISO 16620 series, the “biobased content” of biobased plastics refers to the amount of the biobased carbon content, the amount of the biobased synthetic polymer content or the amount of the biobased mass content only.

Plastics — Biobased content —

Part 5:
Declaration of biobased carbon content, biobased synthetic polymer content and biobased mass content

1 Scope

This document specifies the requirements for the declarations and labels of the biobased carbon content, the biobased synthetic polymer content and the biobased mass content in plastic products.

This document is applicable to plastic products and plastic materials, polymer resins, monomers or additives, which are made from biobased or fossil-based constituents.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 14020, *Environmental labels and declarations — General principles*

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

ISO 16620-2, *Plastics — Biobased content — Part 2: Determination of biobased carbon content*

ISO 16620-3, *Plastics — Biobased content — Part 3: Determination of biobased synthetic polymer content*

ISO 16620-4, *Plastics — Biobased content — Part 4: Determination of the biobased mass content*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16620-1 and ISO 16620-4 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Symbols and abbreviated terms

4.1 Symbols

x_B^{TC} percent biobased carbon content to total carbon

x_B^{TOC} percent biobased carbon content to total organic carbon

m_{BSP} biobased synthetic polymer content

m_B biobased mass content

4.2 Abbreviated terms

TC total carbon

TOC total organic carbon

5 General principles

The general principles for the development and use of environmental labels and declarations established in ISO 14020 shall be followed with modest modifications for biobased plastics as follows:

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

b) Principle 2: procedures and requirements for 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: 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 labels and declarations shall be available and provided upon request to all interested parties.

e) Principle 5: the development of labels and declarations shall take into consideration all relevant aspects of the claim they are intended for.

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

g) Principle 7: any administrative requirements or information demands related to 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 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 aspects of products and services relevant to a label or declaration shall be available to purchasers and potential purchasers from the party making the label or declaration.

The requirements for self-declared environmental claims, including statements, symbols and graphics, regarding products, specified in ISO 14021 shall be satisfied.

Examples of labelling systems are given in Annex A.

6 Declarations of the biobased content

6.1 Principle

The declaration of the biobased content according to this document is applicable to plastic products and plastic materials, polymer resins, monomers or additives which are made from biobased and/or fossil-based constituents.

The biobased carbon content, the biobased synthetic polymer content or the biobased mass content determined by applying ISO 16620-2, ISO 16620-3 or ISO 16620-4, respectively, shall be declared only by using the format described in 6.2, 6.3, or 6.4, respectively.

The responsible party for placing biobased plastic products on the market should verify if the presence of the label could be erroneously considered as a proof of suitability to organic recovery (i.e. composting and anaerobic digestion according to ISO 18606 or equivalent specifications) by the consumers and, therefore, bring to unaware wrong waste separation behaviour. If there is a risk of misinterpretation, for example, for disposable single-use products placed on those markets where organic waste collection has been already implemented, then the responsible party should adopt further forms of communication to the consumers to make them aware of the recovery characteristics of the biobased product and, therefore, reduce the risks of waste misplacement caused by misinterpretation of the label and term “biobased”.

6.2 Declaration of the biobased carbon content

The declaration of the biobased carbon content, expressed as a percentage of the total organic carbon, x_B^{TOC}, shall consist of a statement, where x_B^{TOC} is the value determined according to ISO 16620-2, rounded to the nearest integer.

The declaration of the biobased carbon content, expressed as a percentage of the total carbon, x_B^{TC}, shall consist of a statement, where x_B^{TC} is the value determined according to ISO 16620-2, rounded to the nearest integer.

Information shall be provided as follows:

a) product identification;

b) biobased carbon content according to ISO 16620-2;

   1) expressed as a percentage of TOC: X %

   and

   2) expressed as a percentage of TC: X %

c) “this declaration is in agreement with ISO 16620-5”.

6.3 Declaration of the biobased synthetic polymer content

The declaration of the biobased synthetic polymer content, expressed as a percentage of mass, m_{BSP}, shall consist of a statement, where m_{BSP} is the value determined according to ISO 16620-3, rounded to the nearest integer.

Information shall be provided as follows:

a) product identification;

b) biobased synthetic polymer content according to ISO 16620-3, expressed as a percentage of the total mass: X %;

c) “this declaration is in agreement with ISO 16620-5”.

6.4 Declaration of the biobased mass content

The declaration of the biobased mass content, expressed as a percentage of the total mass, m_B, shall consist of a statement, where m_B is the value determined according to ISO 16620-4.

Information shall be provided as follows:

a) product identification;

b) biobased mass content according to ISO 16620-4, expressed as a percentage of the total mass: X %;

c) “this declaration is in agreement with ISO 16620-5”.

Annex A
(informative)

Examples of labelling systems

A.1 General

Examples of labelling systems are listed in Table A.1.

Table A.1 — Examples of labelling systems

Name of the certification system	Organization	Type of declaration	Reference website
BioPreferred	United States Department of Agriculture (USDA)	Biobased carbon content	www.biopreferred.gov/
BiomassPla	Japan BioPlastics Association (JBPA)	Biobased synthetic polymer content	www.jbpaweb.net/english/english.htm
Biobased Indicator	Association Chimie du Végétal (ACDV)	Biobased mass content	www.chimieduvegetal.com/pageLibre000110dd.asp
DIN-Geprüft Biobased Products	DIN CERTCO Gesellschaft für Konformitätsbewertung mbH	Biobased carbon content Biobased synthetic polymer content	www.dincertco.de/en/dincertco/home.jsp
OK Biobased	AIB-Vinçotte International s.a./n.v.	Biobased carbon content	www.okcompost.be/en/recognising-ok-environment-logos/ok-biobased/

A.2 USDA's BioPreferred program

USDA's BioPreferred program was created by the 2002 Farm Bill to increase the purchase and use of biobased products within the Federal Government. Congress reauthorized and strengthened the program in the 2008 Farm Bill to further promote the sale of biobased products. With the launch of this new biobased product label, USDA's BioPreferred program is now comprised of two parts: a biobased product procurement preference program for federal agencies and a voluntary labelling initiative for the broad-scale marketing of biobased products.

A.3 JBPA's BiomassPla Identification and Labelling system

JBPA's BiomassPla Identification and Labelling system was started from July 2006. The system is based on the following:

a) The Positive List System for all biobased synthetic polymers and its compounds, films, etc.

b) The minimum value of the biobased synthetic polymer content is 25 % (by weight) of products measured by ^{14}C measurement based on ISO 16620-2 and calculated based on ISO 16620-3.

c) All components do not contain any non-usable material decided by JBPA.

A.4 ACDV's Biobased Indicator

The Biobased Indicator was developed in 2010 as a promotion tool for biobased products. It differs from the USDA labelling system which is focused on the declaration of the biobased carbon ratio. Its goal was to enable the declaration of the total biomass contained in a given product, including other elements

than carbon. It also differs from the JPBA labelling approach by taking into account any type of biomass including native starch and cellulose, which are not taken into consideration for the calculation of the JBPA biobased synthetic polymer content.

A.5 DIN-Geprüft Biobased Products

In 2010, DIN CERTCO developed a certification system based on the most recent ASTM D6866, available based on the internationally approved "DIN-Geprüft [DIN-tested]" conformity mark. With the marks "Biobased 20-50 %", "Biobased 50-85 %" and "Biobased > 85%", the percentage range of biobased carbon as part of the total carbon is directly visible for the products, intermediates and resins certified. Since 2013, DIN CERTCO offers conformity assessment additionally or separately according to CEN/TS 16137 (DIN SPEC 91236) and ISO 16620 with this certification system, too.

A.6 OK Biobased

The OK Biobased certification scheme uses a star system to indicate the biobased mass content of a product. A one-star biobased product has biobased mass content between 20 % and 40 % while a four-star certified product has a biobased mass content greater than 80 %.

This certification applies to basic/raw materials, intermediates, and finished products with at least 30 % organic carbon fraction and 20 % biobased carbon content.

All products which are (partially) manufactured from biobased plastics or materials of natural origin are suitable for the OK Biobased certification scheme.

Bibliography

[1] ISO 16620-1, *Plastics — Biobased content — Part 1: General principles*

[2] ISO 18606, *Packaging and the environment — Organic recycling*

[3] ASTM D6866-12, *Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis*

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

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