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Irish Standard Recommendation
S.R. CEN/TS 16640:2014

Bio-based products - Determination of the bio based carbon content of products using the radiocarbon method

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NSAI	T +353 1 807 3800	Sales:
1 Swift Square,	F +353 1 807 3838	T +353 1 857 6730
Northwood, Santry	E standards@nsai.ie	F +353 1 857 6729
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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16640

March 2014

ICS 13.020.60; 71.040.40; 83.040.01

English Version

Bio-based products - Determination of the bio based carbon content of products using the radiocarbon method

Produits biosourcés - Détermination de la teneur en carbone biosourcé des produits par la méthode du carbone radioactif

Biobasierte Produkte - Bestimmung des biobasierten Kohlenstoffanteils von Produkten mittels Radiocarbonmethode

This Technical Specification (CEN/TS) was approved by CEN on 9 December 2013 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.

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (CEN/TS 16640:2014) has been prepared by Technical Committee CEN/TC 411 “Bio-based products”, the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under Mandate M/492 "Mandate addressed to CEN, CENELEC and ETSI for the development of horizontal European Standards and other standardization deliverables for bio-based products".

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

Bio-based products from forestry and agriculture have a long history of application, such as paper, board and various chemicals and materials. The last decades have seen the emergence of new bio-based products in the market. Some of the reasons for the increased interest lie in the bio-based products' benefits in relation to the depletion of fossil resources and climate change. Bio-based products may also provide additional product functionalities. This has triggered a wave of innovation with the development of knowledge and technologies allowing new transformation processes and product development.

Acknowledging the need for common standards for bio-based products, the European Commission issued Mandate M/492[1)], resulting in a series of standards developed by CEN/TC 411, with a focus on bio-based products other than food, feed and biomass for energy applications.

The standards of CEN/TC 411 "Bio-based products" provide a common basis on the following aspects:

— Common terminology

— Bio-based content determination

— Life Cycle Assessment (LCA)

— Sustainability aspects

— Declaration tools

Iit is important to understand what the term bio-based product covers and how it is being used. The term 'bio-based' means 'derived from biomass'. Bio-based products (bottles, insulation materials, wood and wood products, paper solvents, chemical intermediates, composite materials, etc.) are products which are wholly or partly derived from biomass. It is essential to characterize the amount of biomass contained in the product by, for instance, its bio-based content or bio-based carbon content.

The bio-based content of a product does not provide information on its environmental impact or sustainability, which may be assessed through LCA and sustainability criteria. In addition, transparent and unambiguous communication within bio-based value chains is facilitated by a harmonized framework for certification and declaration.

This Technical Specification has been developed with the aim to specify the method for the determination of bio-based carbon content in bio-based products using the ^{14}C method. This method using the ^{14}C method is based on the analytical test methods used for the determination of the age of objects containing carbon.

This Technical Specification provides the reference test methods for laboratories, producers, suppliers and purchasers of bio-based product materials and products. It may be also useful for authorities and inspection organizations.

Part of the research leading to this document has been performed under the European Union Seventh Framework Programme (see http://www.kbbpps.eu).This document is based on EN 15440 [1] prepared by CEN/TC 343, "Solid recovered fuels", EN ISO 13833 [2], prepared by ISO/TC 146 "Air quality" and CEN/TC 264 "Air quality", and CEN/TS 16137 [3], prepared by CEN/TC 249, "Plastics".

The analytical test methods specified in this Technical Specification are compatible with those described in ASTM D 6866-12 [4].

1) A mandate is a standardization task embedded in European trade laws. Mandate M/492 is addressed to the European Standardization bodies, CEN, CENELEC and ETSI, for the development of horizontal European Standards for bio-based products.

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1 Scope

This Technical Specification specifies a method for the determination of the bio-based carbon content in products, based on the ^{14}C content measurement.

It also specifies three test methods to be used for the determination of the ^{14}C content from which the bio-based carbon content is calculated:

— Method A: Liquid scintillation-counter method (LSC);

— Method B: Beta-ionization (BI);

— Method C: Accelerator mass spectrometry (AMS).

The bio-based carbon content is expressed by a fraction of sample mass, as a fraction of the total carbon content or as a fraction of the total organic carbon content.

This calculation method is applicable to any product containing organic carbon, including biocomposites.

NOTE This Technical Specification does not provide the methodology for the calculation of the biomass content of a sample.

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 15400, *Solid recovered fuels — Determination of calorific value*

EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*

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

3 Terms and definitions

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

3.1
bio-based carbon content
fraction of carbon derived from biomass in a product

Note 1 to entry: There are several approaches to express the bio-based carbon content. These include as a percentage of: the mass; the total carbon content, or the total organic carbon content, of the sample. These are detailed in the relevant standards of CEN/TC 411.

[SOURCE: prEN 16575:2013 [5]]

3.2
biomass content
see bio-based content

[SOURCE: prEN 16575:2013 [5]]

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