SLOVENSKI STANDARD
SIST-TP CEN/TR 16208:2014

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Bioizdelki - Pregled standardov

Biobased products - Overview of standards

Biobasierte Produkte - Übersicht über Normen

Produits biosourcés - Vue d'ensemble des normes

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Biobased products - Overview of standards

Produits biosourcés - Vue d'ensemble des normes

Biobasierte Produkte - Übersicht von Normen und Standards

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Foreword

This document (CEN/TR 16208:2011) has been prepared by Technical Committee CEN/BT/WG 209 “Bio-based products”,, the secretariat of which is held by DIN .

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1 Scope

This Technical Report analyzes a set of standards, documents and other reports, related to bio-based products. The report is limited to the aims of mandate M/429 on bio-based products, and hence excludes traditional products, energy applications and food.

2 Criteria & approach

2.1 Results presented in this report

1. Criteria and approach

2. A standards and documents analysis matrix, which identifies relevant standards, manuals and reference documents on bio-based products, and their relevance to pre-defined criteria

3. A chapter with descriptions of the scope of all the relevant standards, manuals and reference documents; an evaluation of the applicable criteria to each paper ('horizontal assessment" of the matrix)

4. A chapter with an evaluation of coverage per criterion and the resulting gap ("vertical assessment" of the matrix)

5. Conclusions

Sources of information include:

— EU Lead Market Initiative documents (LMI);

— standards (CEN, ASTM, ASME, BSI, VDI);

— web posted information such as certification schemes; and

— knowledge of Task group members;

2.2 Criteria list

In relation to bio-based products, the following criteria are evaluated in this report:

1. Bio-content / Amount of Renewable Raw materials;
2. Product Functionality / Technical Performance ;
3. End of life:
    a. Biodegradability;
    b. Compostability;
    c. Recycling;
    d. Durability.

4. Life-Cycle Assessment:
    a. GHG emissions;
    b. Energy use;
    c. Other LCA criteria.
5. Sustainability:
    a. Environmental;
    b. Social;
    c. Economic.

2.3 Analysis approach

The documents in the gap-analysis matrix are evaluated by their relevance. First, their scope is presented. Then their applicability for bio-based product standards in general terms is evaluated. This is the horizontal evaluation.

A vertical evaluation on each criterion will be presented, in order to highlight coverage and gaps.

3 Terms and definitions

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

NOTE Existing definitions [and their source(s)] of the evaluated criteria are listed below.

3.1 Bio-content / Amount of renewable raw materials

3.1.1
bio-based
derived from biomass

[CEN BT/WG 209]

3.1.2
bio-based carbon content
carbon in a sample that is of recent origin, as evidenced by its 14C isotope content

NOTE 1 The amount of bio-based carbon in the material or product is often expressed as a percent of the weight(mass) of the total organic carbon of the product

[CEN/TR 15932]

NOTE 2 ASTM D6852-02 defines bio-based content as the amount of bio-based material as fraction weight or percent weight of the total material

3.1.3
bio-based product
product wholly or partly bio-based

NOTE The bio-based product is normally characterised by the bio-based content.

[CEN BT/WG 209]

3.1.4
biomass
material of biological origin excluding material embedded in geological formations and/or fossilized

NOTE This definition refers to the well-known short-cycle of carbon, i.e. the life cycle of biological materials (e.g. plants, algae, marine organisms, forestry, micro-organisms, animals, and biological waste from households, agriculture, animals and food/feed production).

[CEN BT/WG 209]

3.1.5
biomass content
mass fraction of bio-based material

NOTE Claim of biomass content is difficult to verify due to lack of standards.

[CEN/TR 15932]

3.1.6
renewable raw material
material used to produce a product and replenished by natural processes at a rate comparable to its exploitation rate

[Adapted from ISO 14040 and CEN/TR 15932]

3.2 Product functionality / Technical performance

3.2.1
product
any goods or service

[ISO 14040:2006]

3.2.2
product function
characteristic attribute or characteristic in the performance and use of a product

[ISO 14024:1999]

NOTE The first criterion to be considered in the choice of materials and design of a product is that it shall perform the function for which it is intended to an acceptable standard. These criteria will vary depending on the application but the key requirements are:

— meeting legal and statutory requirements including for example composition control and migration limits for food contact, physical performance for containing of hazardous products;

— functional including physical strength, hygiene, safety and barrier performance;

— use performance including opening, closing, pouring/emptying, child resistant;

— minimum use of material, consistent with the three points above;

— content identification and communication.

The specifications of the product should be defined by the performance requirements, and not by the source of material.

3.3 End of life / Biodegradability / Compostability / Recycling / Durability

3.3.1
biodegradation
degradation caused by biological activity especially by enzymatic action leading to a significant change of the chemical structure of a material

[EN 13193:2000]

3.3.2
biodegradable
capable of undergoing biological anaerobic or aerobic degradation leading to CO_2, H_2O, methane, biomass and mineral salts depending on the environmental conditions of the process

[CEN/TR 15932]

3.3.3
compostability
potential of a material to be disintegrated and biodegraded without hindrance in a composting process

[Based on EN 13193:2000]

3.3.4
durability
capability of a product or any component to satisfy, with planned maintenance, the design performance requirements over a specified period of time under the influence of the environmental actions, or as a result of a self-ageing process

[Adapted from ISO 15928-3]

3.3.5
maximum level of biodegradation
degree of biodegradation, measured in percent, of a chemical compound or organic matter in a test, above which no further biodegradation takes place during the test

[ISO 14853:2005]

3.3.6
organic recycling (organic recovery)
aerobic (composting) or anaerobic (biomethanization) treatment, under controlled conditions and using microorganisms, of the biodegradable parts of waste, which produces stabilized organic residues or methane. Landfill shall not be considered a form of organic recycling

[adapted from Directive 94/62/EC]

3.3.7
recycling
reprocessing in a production process of the waste materials for the original purpose or for other purposes including organic recycling but excluding energy recovery

[Directive 94/62/EC]

3.3.8
ultimate biodegradability
breakdown of an organic chemical compound by micro-organisms in the presence of oxygen to carbon dioxide, water and mineral salts of any other elements present (mineralization) and new biomass or in the absence of oxygen to carbon dioxide, methane, mineral salts and new biomass

[EN 13432:2000, also in EN 14995:2006]

3.4 Life-Cycle Assessment / GHG emissions / Energy use / Other LCA criteria

3.4.1
greenhouse gas
GHG
gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds

NOTE GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro-fluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6)

[ISO 14064-1:2006]

3.4.2
greenhouse gas emission
total mass of a GHG released to the atmosphere over a specified period of time

[ISO 14064-1:2006]

3.4.2
life cycle
consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal

[ISO 14040:2006]

3.4.3
life cycle assessment (LCA)
compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

[ISO 14040:2006]

3.4.4
life cycle inventory (LCI)
collection and assembly of materials and energy input and output data for a specified product system

NOTE LCI is only one of the phases in conducting an LCA and is not an assessment of the environmental impacts associated with the product system

[ASTM D 7075 – 04]

3.5 Sustainability / Environmental / Social / Economic criteria

3.5.1
biological diversity values
intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components

[NTA 8080]

3.5.2
environmental aspect
element of an organization's activity or products that can interact with the environment [ISO 14021:1999]

3.5.3
environmental claim
statement, symbol or graphic that indicates an environmental aspect of a product, a component or packaging

[ISO 14021:1999]

NOTE An environmental claim may be made on product or packaging labels, through product literature, technical bulletins, advertising, publicity, telemarketing, as well as through digital or electronic media such as Internet.

3.5.4
environmental impact
any change to the environment, whether adverse or beneficial, wholly or partially resulting from a products environmental aspects

[Adapted from ISO 14001:2004]

3.5.5
environmental impact assessment

a process of predicting and evaluating the effects of an action or series of actions on the environment, then using the conclusions as a tool in planning and decision-making

[RSPO]

3.5.6
environmental profile or environmental footprint
environmental consequences of the creation of a material, measured in terms of impact indicators such as the generation or recapture of CO2, biodegradability, recycling, and so forth

[ASTM D6852]

3.5.7
product environmental criteria
environmental requirements that the product shall meet in order to be awarded an environmental label

[ISO 14024:1999]

3.5.8
social and economic sustainability criteria
NOTE At the moment there are no clear definitions on social and economic sustainability criteria. This is currently under investigation in CEN/TC 383.

4 Standards and documents analysis matrix

Document Reference	Title		1. Bio-content / Amount of Renewable Raw materials	2. Product Functionality / Technical Performance	3. End of life	a.Biodegradability	b.Compostability	c. Recycling	d. Durability	4. Life-Cycle Assessment	a. GHG emissions	b. Energy use	c. Other LCA criteria	5. Sustainability	a.Environmental	b. Social	c. Economic
ANSI/ASABE S 593:2006	Terminology and Definitions for Biomass Production, Harvesting and Collection, Storage, Processing, Conversion and Utilization	5.1	y	y	y	y	n	n	n	n	y	y	y	n	n	n	n
CEN/TR 15932	Plastics - Recommendation for terminology and characterisation of biopolymers and bioplastics	5.1	y	y	y	y	y	y	n	n	y	y	n	n	y	n	n
ILCD/ELCD	Int Life Cycle Data system handbook and European database	5.2	n	n	y	n	n	y	n	y	y	y	y	n	y	n	n
CR13910 CEN TC 261	Reporting criteria for life cycle analysis for packaging	5.2	n	n	y	n	n	n	n	y	n	n	y	n	y	n	n
ASTM D7075	Standard Practice for Evaluating and Reporting Environmental Performance of Biobased Products	5.2	y	n	y	y	n	n	n	y	n	n	y	y	y	n	n
VDI 4431	Life-cycle management in the manufacturing industry	5.2	n	n	y	n	n	y	n	y	n	n	n	n	y	y	n
ISO 14064-1:2006	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals	5.2	n	n	y	n	n	n	n	y	y	n	n	n	n	n	n
ISO/WD 14067-1	Carbon footprint of products	5.2	n	n	y	y	n	y	n	y	y	y	n	n	n	n	n
ISO/NP 14046	Water footprint - principles, requirements and guidance	5.2	n	n	y	n	n	n	n	y	y	n	n	n	n	n	n
NTA 8080	Sustainability criteria for biomass for energy purposes	5.2	n	n	n	n	n	n	n	y	y	y	y	y	y	y	y

BEES	USDA green public procurement	5.2	y	n	y	y	y	y	n	y	y	y	y	y	y	y	y
ASTM D6852	Standard Guide for Determination of Biobased Content, Resources Consumption, and Environmental Profile of Materials and Products	5.2	y	n	n	n	n	n	n	y	y	y	y	n	y	n	n
ISO DIS 26000	Guidance on social responsibility	5.2	n	n	y	n	n	n	n	y	y	y	y	y	y	y	y
ISO 14025	Environmental labels and declarations - Type III environmental declarations - Principles and procedures	5.2	n	n	y	y	n	n	n	y	y	y	y	n	n	n	n
ISO 14040 series	Environmental management - Life cycle assessment - Principles and framework	5.2	n	y	y	n	n	y	n	y	y	y	n	n	y	n	n
PAS 2050	Specification for the assessment of the life cycle greenhouse gas emissions of goods and services	5.2	y	y	y	n	n	y	n	y	y	y	n	n	y	n	n
BP X30-323	General principles for an environmental communication on mass market products	5.2	y	y	y	n	n	y	n	y	y	y	y	n	y	n	n
ASTM D6866-6a	Standard Test Methods for Determining the Biobased Content of Natural Range Materials Using Radiocarbon and Isotope Ratio Mass Spectrometry Analysis	5.3	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n
ASTM D7026	ASTM D7026 - 04 Standard Guide for Sampling and Reporting of Results for Determination of Biobased Content of Materials via Carbon Isotope Analysis	5.3	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n
WI 00249737	Plastics - Biopolymers - Determination of biobased carbon content	5.3	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n
EN 15440	Solid recovered fuels - Method of the determination of biomass content	5.3	y	n	n	n	n	n	n	n	n	n	n	n	n	n	n
ISO 15380	Lubricants, industrial oils and related products (class L) - Family H (Hydraulic systems) - Specifications for categories HETG, HEPG, HEES and HEPR	5.4	n	y	y	y	n	y	n	n	n	n	n	n	y	n	n
EU Ecolabel 2005/360/EC	European_Eco-label_to_lubricants.pdf	5.4	y	y	y	y	n	n	n	n	n	n	n	n	y	n	n
Blue Angel	RAL-UZ-48 Readily Biodegradable Chain Lubricants for Power Saws	5.4	n	n	y	y	n	n	n	n	n	n	n	n	y	n	n
Blue Angel	RAL-UZ 64 Lubricants & Forming	5.4	n	n	y	y	n	n	n	n	n	n	n	n	y	n	n

	oils																
Blue Angel	RAL-UZ 79 Hydraulic Fluids	5.4	n	y	y	y	n	n	n	n	n	n	n	n	y	n	n
SS 155434	Hydraulic fluids - Requirements and test methods	5.4	y	y	y	y	n	n	n	n	n	n	n	n	y	n	n
SS 155470	Lubricants, industrial oil and related products (Class L) Specifications for family X (Greases)	5.4	n	y	y	y	n	n	n	n	n	n	n	n	y	n	n
ISO DIS 12924	Lubricants, industrial oils and related products (Class L)— Family X (Greases)— Specification	5.4	n	y	n	n	n	n	n	n	n	n	n	n	n	n	n
EN 14995	Plastics - Evaluation of compostability - Test scheme and specifications	5.4	n	n	y	y	y	n	n	y	n	n	n	n	n	n	n
EN 13432:2000	Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging	5.4	n	n	y	y	y	n	n	n	n	n	n	n	n	n	n
EN 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 (ISO 14855-1:2005)	5.4	n	n	y	y	n	n	n	n	n	n	n	n	n	n	n
prCEN/TR 15822	Plastics - Biodegradable plastics in or on soil - Recovery, disposal and related environmental issues	5.4	n	n	y	y	n	n	n	n	n	n	n	n	n	n	n
NF U 52-001	Biodegradable materials for use in agriculture and horticulture — Mulching products — Requirements and test methods	5.4	n	y	y	y	y	n	y	n	n	n	n	n	y	n	n
CEN TS15534-1, 2 & 3	Wood plastic composites	5.4	n	y	n	n	n	y	y	n	n	n	n	n	n	n	n
XP T 25-501	Reinforcement fibres - Flax fibres for plastics composites	5.4	n	y	n	n	n	n	n	n	n	n	n	n	n	n	n
ISO 22621	Plastics piping systems for the supply of gaseous fuels	5.4	n	y	n	n	n	y	y	n	n	n	n	n	n	n	n
Cradle to cradle	Cradle to CradleSM Certification Program	5.4	y	n	y	y	y	y	n	n	n	y	y	y	y	y	n

5 Scope of standards

5.1 Vocabulary

5.1.1 ANSI/ASABE S 593:2006 - Terminology and Definitions for Biomass Production, Harvesting and Collection, Storage, Processing, Conversion and Utilization

5.1.1.1 Scope of ANSI/ASABE S 593

The purpose of this standard is to provide uniform terminology and definitions in the general area of biomass production and utilization. This includes all the terminologies that are used in biomass feedstock production, harvesting, collecting, handling, storage, processing and conversion, bioenergy, biofuels, biopower and bioproducts.

5.1.1.2 Evaluation of ANSI/ASABE S 593

This standard provides a list of 69 definitions related to biomass and production, particularly from an energy point of view. The definitions include three main categories of biomass, which are primary, secondary and tertiary biomass. Animal products are not included in the primary biomass. Bio-based product is defined as fuels, food, feed, chemicals, or industrial materials commercially produced in whole or in-part from biomass materials. The term Greenhouse Gases is explained slightly deviating from the ISO 14064 definition. Other terms are more related to energy and production, and do not overlap with the definitions as posted in this report.

5.1.2 CEN/TR 15932 Plastics - Recommendation for terminology and characterisation of bioplastics

5.1.2.1 Scope of CEN/TR 15932

This Technical Report gives recommendations for bioplastics and biopolymers related terminology. These recommendations are based on a discussion of commonly used terms in this field.

This Technical Report also briefly describes the current test methods state of the art in relation to the characterization of bioplastics and products made thereof.

5.1.2.2 Evaluation of CEN/TR 15932

The terminology and definitions have been documented particularly in order to provide a basis for more standards in the field of bio-based plastics. Although the terms focus on applications in plastics, most terminology has a wider applicability to bio-based materials in general. The CEN/TR 15932 definition for biomass is material of biological origin excluding material embedded in geological formation or fossilized. Other definitions do not conflict with the definitions of this report.

5.1.2.3 Other vocabulary standards

The following standard could also be considered for bio-based vocabulary, but is not evaluated here:

X30-110, *Raw materials and energy – Vocabulary and methodology in determination of energy content – Energy equivalents*