# Standards and Labels related to Biobased Products

## Developments in the 2016-2018 triennium

The aim of this report is to provide information about existing standardisation approaches for biobased products, and to monitor relevant activities shortly before and during the triennium period (2016-2018).

IEA Bioenergy

IEA Bioenergy Task 42: October 2018

# Standards and Labels related to Biobased Products

## Developments in the 2016-2018 triennium

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# Framework and aim

Standardisation and certification for bioenergy and biofuels have been done by other IEA Bioenergy Tasks already, e.g. "Monitoring Sustainability Certification of Bioenergy" by Task 40 in 2013. However, an overview on standardisation of biobased products is still missing.

The aim of this report is to gather relevant information about existing standardisation approaches for biobased products, and to monitor relevant activities before and during the triennium period (2016-2018). This activity's focus is on products; national and/or company reporting is beyond the scope of this report. The agreed deliverable to monitor the developments is a slide-deck.

In addition to the slide-decks a brief description of the background, current standards and labels is provided together with three tables showing the current standards for biobased products, standards related to plastic products and wood plastic composite (WPC) in Europe, as well as ongoing and future standard development relevant for biobased products. Both this brief description and the slide-decks are integrated in this deliverable (D4) report.

# Background

In order to cope with an increasing global population, rapid depletion of many resources, increasing environmental pressures and climate change, the world needs to radically change its approach to production, consumption, processing, storage, recycling and disposal of biological resources. Establishing a bioeconomy holds a great potential: it can maintain and create economic growth and jobs in rural, coastal and industrial areas, reduce fossil fuel dependence, and improve the economic and environmental sustainability of primary production and processing industries.

Many policies have been put in place to tackle these challenges and drive the transformation of the worldwide economy. However, the complex inter-dependencies that exist between challenges can lead to trade-offs, such as the controversy about competing uses of biomass. The latter arose from concerns about the potential impact on food security of the growing demand for renewable biological resources driven by other sectors, the use of scarce natural resources and the environment.

The bioeconomy encompasses the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy. Its sectors and industries have strong innovation potential due to their use of a wide range of sciences, enabling and industrial technologies, along with local and tacit knowledge.

Renewable materials will continue to play an important role in production processes, particularly in a circular economy. In this context, attention must be paid to the environmental and social impacts of their production, both in the EU and in non-EU countries.

Global challenges demand global solutions. This requires a global approach to more sustainable resource use and includes developing an internationally shared understanding of biomass sustainability.

# Standards

Standardisation is an important tool that specifies requirements for products, services or procedures, and is used to set benchmarks and criteria to harmonise behavior in industry and society. The International Organisation for Standardisation (ISO), the European Committee for Standardisation (CEN), and national standardisation bodies are suitable platforms to bring different stakeholders together, and to agree on standards that serve the safety of humans, the environment and products. Standardisation may support national legislation by filling in legal requirements and/or gaps. Most of the standards are voluntary market agreements. Standards are tools that set out specifications and other technical information on various kinds of products, materials, services and processes. Standards provide a basis for mutual understanding among individuals, businesses, public authorities and other kind of organisations. They facilitate communication, commerce, measurement/testing and manufacturing.

An important instrument for accelerating the development of standards in Europe is the allocation of mandates. Mandates are the mechanism by which the European Commission (EC) calls upon the European standardisation bodies (CEN) to develop and adopt European standards to support European policies and legislation. In Europe, the majority of CEN's work in the area of chemical and bio-based products is conducted in response to requests from the European Commission. The following mandates are relevant for IEA Bioenergy Task 42:

M/430 – Bio-polymers and bio-lubricants

M/491 – Bio-surfactants and bio-solvents

M/492 – Bio-based products

M/547 – Algae and algae-based products or intermediates

# Labels

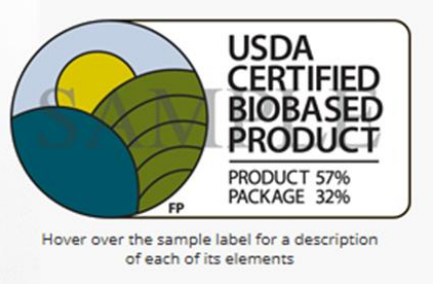
There are many biobased product and food labels in the US. In August 2018, there were 463 different "EcoLabels" across 25 industry sectors, "and new organic and sustainable ranking lists are popping up all the time." Most ecolabels are dealing with primary biomass or energy efficiency, more details are provided at http://www.ecolabelindex.com .

In Europe the forum for bio-based innovation in public procurement https://www.biobasedconsultancy.com/en/database provides an overview of bio-based products and producers for nine product categories.

The cultivation of renewable resources (usually from forestry and agriculture, sometimes from marine aquaculture) has a huge impact on the sustainability of the final biobased products (a non-exhaustive list is provided in the Slide deck - Part 1).

ISO differentiates between Type I, II and III ecolabels, of which Type I are the strongest ones. They are voluntary, multiple-criteria based, third party programmes that award a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations. Type II labels are self-declarations, and Type III labels do not set any thresholds and do not claim overall environmental preferability.

In the US biobased products are commercial or industrial goods (other than food or feed) determined by the U.S. Department of Agriculture (USDA) Secretary to be composed in whole or in significant part of biological products, forestry materials, or renewable domestic agricultural materials, including plant, animal, or marine materials. Procurement of biobased products is required by Section 9002 of the Farm Security and Rural Investment Act (FSRIA) of 2002, Public Law 107-171. It authorises USDA to designate biobased products for federal procurement. The overall framework for the USDA program can be found in the U.S. Code of Federal Regulations 7 CFR 2902. Section 9002 of the 2008 Farm Bill requires federal agencies to purchase biobased products designated as Bio-Preferred, except as provided in Federal Acquisition Regulation (FAR) Part 23.404(b).




Federal agencies in the US are required to give preference to the item with the highest percentage of biobased content where purchases exceed $10,000 per fiscal year, as prescribed by 7 CFR 2902.3. The following sections of Part 23 of the Federal Acquisition Regulation (FAR) pertain to biobased items:

- FAR 23.403 requires competitive cost-effective purchases of products that meet reasonable performance requirements and contain biobased content;
- FAR 23.404 requires agencies to have an Affirmative Procurement Program (APP) that provides guidelines for purchasing items with biobased content;
- FAR 23.406 requires the insertion of contract clauses regarding the use of USDA-designated items; and
- FAR 23.703 requires agencies to implement cost-effective green contracting preference programs, employ sustainable acquisition strategies, and consider the use of biobased products.

Specifications for procurement must require the use of biobased products in these designated item categories. Exceptions may be made when:

- There are less than two suppliers available for an item;
- The item is unreasonably priced;
- Delivery costs of the item are excessive; or
- Regular delivery cannot be guaranteed.[1]

[1] https://www.gsa.gov/governmentwide-initiatives/sustainability/buy-green-products-services-and-vehicles/buy-green-products/biobased-and-biopreferred-products

In Europe, three multi-issue ecolabels exist of ISO 14024 type I. The EU Ecolabel, the Nordic Ecolabel, and the Blue Angel Ecolabel. Specific product categories that include biobased products under these labels are lubricants, sanitary products, food disposables, and office materials.

Due to the EU's renewable energy policy, several certification schemes for agricultural biomass are developed. Some of them have by now adapted their schemes in a way that they can be applicable also to materials, not only to energy. For wood, sustainability certification schemes (FSC and PEFC) were developed before the renewable energy policy due to concerns about unsustainable forestry practices in many parts of the world.

Organisations can use the biobased content certification scheme (Type III) to demonstrate the (minimum share of) biobased content in their products and label them with this claim. In order to be certified for the biobased content in products according to Bio-based content certification scheme, an organisation needs to be assessed by an independent authority (third party): a certification body. Only certification bodies that have entered into an agreement with NEN are allowed to do these conformity assessments for the biobased label.

The process for being granted a certificate is described in the certification roadmap, which is described for Europe at (http://www.biobasedcontent.eu/en/certification/roadmap ). Certification audits are performed by certification bodies that have entered into agreement with NEN. Samples shall be analysed by recognised testing laboratories; some authorised laboratories in the US, China, Belgium, The Netherlands, and Germany are shown at the following link http://www.biobasedcontent.eu/en/certification/testing-laboratories

Existing certification of biobased content refers to biobased carbon content, and is based on the European norm EN 16785-1 "Biobased products - Biobased content - Part 1: Determination of the biobased content using the radiocarbon analysis and elemental analysis", and by the American standard ASTM 6866 "Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis", but also refers to CEN TS 16137 "Plastics – Determination of biobased carbon content".

There is a number of certifications and labels that highlight the special end-of-life options of biobased products, such as compostability, biodegradability in soil, biodegradability in seawater, etc. Biodegradability is a relevant aspect in the life cycle of specific products, particularly those made of biobased materials.

The KBBPPS: Knowledge Based Biobased Products' Pre-Standardisation reports[2] concluded that biodegradability tests should be further developed.

Biodegradability reaches, however, further than only biobased products. Non-biobased products can also be biodegradable. That results in the need of further harmonisation of biodegradability standards and criteria. There are a number of biodegradability tests available. Examples of labels are in the slide-deck Part 2 and Part 4.

Plastics are a severe problem in the marine environment. Currently, there is no standard providing clear pass/fail criteria for the degradation of plastics in seawater. The US standard ASTM D7081 "Standard Specification for Non- Floating Biodegradable Plastics in the Marine Environment" has been withdrawn without replacement. However, the test methods that were referred to are still in place, but do not offer any pass/fail criteria. These methods are:

- ASTM D6691 "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum";
- ASTM D 6692 "Standard Test method for Determining the Biodegradability of Radiolabelled Polymeric Plastic Materials in Seawater", and
- ASTM D7473 "Standard Test Method for Weight Attrition of Plastic Materials in the Marine Environment by Open System Aquarium Incubations".

Other standards on this issue are OECD 306 "Biodegradability in sea water" and ISO 16221 "Water quality – Guidance for determination of biodegradability in the marine environment". However, these standards are only guidelines and do not provide clear requirements for conditions and timeframes.

Vinçotte (now TÜV Austria) has developed a certification scheme based on ASTM D7081, which demands, in a simplified way, a biodegradation of at least 90% in 6 months. The corresponding label is "OK Biodegradable Marine". The certification scheme "OK Biodegradable Marine" is generally considered as premature. Being well aware of misunderstandings that can easily arise amongst consumers, the OK Biodegradable Marine certification scheme makes a clear distinction between certification of the claim of marine biodegradation and authorisation to communicate about this certification, and only for a very limited group of products, which are actually used in the marine environment (e.g. fishing lines, etc.). Authorisation to communicate on the product about the OK Biodegradable Marine certificate is allowed.

[2] http://www.biobasedeconomy.eu/projects/kbbpps-knowledge-based-bio-based-products-pre-standardization , see WP6 Biodegradation

# Summary of relevant standards development in the period from 2014 until 2018

Table 1 shows an overview about standards related to biobased products in Europe (CEN/TC 411). The work was subdivided into five working groups:

1. The objective is to develop a standard on general terminology applicable to biobased products, such as bio-lubricants, bio-surfactants, biopolymers and bio-solvents. Where necessary guidance towards the development of terminology for specific biobased products and use in vertical standards should be developed for both other working groups and for users.

2. The development of standards for solvents, covering product functionality (performance), toxicity, ecotoxicity, biodegradability, safety and, if necessary, product specific and sustainability aspects not covered under another CEN/TC 411 working group. Special attention shall be paid to biobased solvents and their possible differences, if any. Biobased solvents might be discriminated by their biological origin, their life-cycle impact and their overall ecological impact. These functions therefore have to be explicitly described and made comparable.

3. The task of this Working Group is the development of methods for the determination of the biobased content of solid, liquid and gaseous products.

4. The development of horizontal standards for biobased products when it comes to sustainability criteria, life cycle analysis and issues related thereto. It is not the purpose of this standardisation work to set thresholds or default values. This is to be done by specific product standards or by political decision.

5. The development of declaration and certification tools applicable to biobased products identifying which characteristics can/should be assessed and how they should be reported. It is not in the scope to define criteria for products and/or packaging

***Table 1: Standards related to biobased products in Europe***

| Working group | No and title | Specification | Year |
|---|---|---|---|
| Terminology | EN 16575 Bio-based products - Vocabulary | Standard | 2014 |
| Bio-solvents | CEN/TS 16766 Bio-based solvents – Requirements and test methods | Technical specification | 2017 |
| Bio-based content | CEN/TS 16721 Bio-based products – Overview of methods to determine the bio-based content | Technical specification | 2014 |
| | EN 16640 Bio-based products – bio-based carbon content – Determination of the bio-based carbon content using the radiocarbon method | Standard | 2017 |
| | EN 16785 (part1) Bio-based products – bio-based content – Determination of the bio-based content using the radiocarbon analysis and elemental analysis | Standard | 2017 |
| | EN 16785 (part2) Bio-based products – bio-based content – Determination of the bio-based content using the material balance method | Standard | 2018 |
| Sustainability criteria, LCA and related issues | CEN/TR 16957 Bio-based-products – Guidelines for Life Cycle Inventory for the End-of-life phase | Technical specification | 2016 |
| | EN 16551: Bio-based products – Sustainability criteria | Standard | 2015 |
| | EN 16560 Bio-based products – Life Cycle Assessment | Standard | 2016 |
| Certification and declaration tools | EN 16848 Bio-based products – Requirements for B-to-B communication of characteristics using Data sheet | Standard | 2016 |
| | EN 16935 Bio-based products – Requirements for Business to Consumer communication and Claim | Standard | 2017 |

In the field of chemicals standardisation activities are ongoing, that cover biodegradable plastics, wood plastics composites (WPC) and biopolymers. Biodegradable plastics can be produced from biomass but also from fossil resources. Consequently, the related standards are valid for biobased plastics, partly-biobased plastics and fossil based plastics. Relevant standards are shown in Table 2.

***Table 2: Standards related to plastic products and WPC in Europe***

| Working Programme | No and title | Specification | Year |
|---|---|---|---|
| CEN/TC 249/WG7 | CEN/TR 17219<br>Plastics - Biodegradable thermoplastic mulch films for use in agriculture and horticulture - Guide for the quantification of alteration of films | Technical report | 2018 |
| | EN 17033<br>Plastics - Biodegradable mulch films for use in agriculture and horticulture - Requirements and test methods | Technical specification | 2018 |
| | EN 13206<br>Plastics - Thermoplastic covering films for use in agriculture and horticulture | Standard | 2017 |
| | EN 13655<br>Plastics - Thermoplastic mulch films recoverable after use, for use in agriculture and horticulture | Standard | 2018 |
| | EN 14932<br>Plastics - Thermoplastic stretch films for wrapping silage bales | Standard | 2018 |
| | EN 17098-1: Plastics - Barrier films for agricultural and horticultural soil disinfection by fumigation - Part 1: Specifications for barrier films | Standard | 2018 |
| | EN 17098-2: Plastics - Barrier films for agricultural and horticultural soil disinfection by fumigation - Part 2: Method for film permeability determination using a static technique | Standard | 2018 |
| CEN/TC 249/WG13 | CEN/TS 17158: Composites made from cellulose based materials and thermoplastics (usually called wood polymer composites (WPC) or natural fibre composites (NFC)) - Determination of particle size of lignocellosic material | Technical specification | 2018 |
| | EN 15534-1: +A1: Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) - Part 1: Test methods for characterisation of compounds and products | Standard | 2014 |
| | EN 15534-4: Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) - Part 4: Specifications for decking profiles and tiles | Standard | 2014 |
| | EN 15534-5: Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) - Part 5: Specifications for cladding profiles and tile | Standard | 2014 |
| | EN 15534-6: +A1: Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) - Part 6: Specifications for fencing profiles and elements | Standard | 2017 |

There are further ongoing standardisation activities related to biobased plastics (CEN/TC 249), surface active agents (CEN/TC 276), textiles (CEN/TC 248), pulp, paper and boards (CEN/TC 172), and leather (CEN/TC 289); a selection of relevant standards under development is shown in in Table 3.

***Table 3: Relevant standards under development relevant for biobased products***

| Working programme | No and title | Status | Year |
|---|---|---|---|
| CEN/TC 249/WG17 | prEN 17228 Plastics - Bio-based polymers, plastics, and plastic products - Terminology, characteristics and communication | Under approval | 2018 |
| CEN/TC 248 | prEN ISO 1833-18 Textiles - Quantitative chemical analysis - Part 18: Mixtures of silk with other protein fibres (method using sulfuric acid) | Under approval | 2018 |
| CEN/TC 248 | prEN ISO 20706-1 Textiles - Qualitative and quantitative analysis of some bast fibres (flax, hemp, ramie) and their blends - Part 1: Fibre identification using microscopy methods | Under drafting | 2018 |
| CEN/TC 289 | prEN ISO 20136 Leather - Determination of degradability by micro-organisms | Under drafting | 2018 |
| CEN/TC 276 | prEN 17035 Surface Active Agents - Bio-based surfactants - Requirements and test methods | Under approval | 2018 |
| | Surface active agents - Bio-based surfactants – Overview on bio-based surfactants | Under drafting | 2018 |

The standardisation work on algae and algae-based products or intermediates has just started. The newly created CEN/TC 454 'Algae and algae products' will focus on the development of the proposed new standards and other deliverables, which are to be finalised by 2021. The work on algae and algae based products is subdivided into six working groups (WG) having the following scope: WG 1: Terminology, WG2: Identification, WG 3: Productivity, WG 4: Specifications for food/feed sector applications, WG 5: Specifications for non-food/feed sector applications, WG 6: Product test methods.

**Slide-deck**

The slide-deck is subdivided in four parts and shows the standard development during the 2016-2018 monitoring period. It is based on presentations held at the IEA Bioenergy Task42 Progress Meetings.

- **Slide-deck – Part 1: (May 2016)**

Provides an overview about labels for biobased and/or compostable products, standards for agricultural feedstock, and relevant activities in the field of biobased products.

- Shows labels for biobased products and products that are compostable.
- Standards how to determine the biobased carbon content in biobased products
- Standards for renewable feedstock in different world regions
- ISO and CEN sustainability standards for bioenergy that encompasses the whole life cycle from renewable material production to its final use for energy applications
- Literature link to standard mapping for biobased products and related claims
- Provides an overview about CEN activities related to standards for biobased products (finalised standards and those that are still under development)
- Future activities towards standardisation activities linking biobased products within the concept of a circular economy.
- New standard to determine the aerobic biodegradability of plastics in marine sediments

# AA2: Product Quality (Part 1)

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on behalf of IEA Task42

# Content

- Biolabel examples
- Biobased Economy and Bioeconomy
- Overview feedstock standards
- Bio-based economy in Europe
- Bioenergy standards – some news
- Biobased products standards
- Circular economy -
  fossil meets biobased

# Bio-labels examples

between 20 and 40 % Biobased

between 40 and 60 % Biobased

between 60 and 80 % Biobased

more than 80 % Biobased

USDA certified

DIN-CERTICO

DIN-CERTICO

Compostable logo US

# Bio-based content

## ECN publishes report on European Pre-Standard for Biobased Carbon Content

Thursday October 1, 2015 09:10

Share Tweet Send

To reduce dependence on fossil fuels, Europe intends to transition to a biobased economy. The vision is to replace fossil feedstock for energy and products with biobased alternatives. And indeed, a growing number of products that is fully or partly biobased (such as bioplastics) enters the market.

This trend makes it ever more relevant to accurately distinguish between fossil-based products and biobased alternatives. In the KBBPPS project, a method has been developed to determine the biobased carbon content of product. Following this method, laboratory analysis can determine the percentage of biobased content in a product.

The basis for the method is radiocarbon dating, the same technique as is used to determine the age of archaeological artifacts. Fossil carbon atoms are much older than their biobased counterparts. Using radiocarbon dating, the numbers of fossil and biobased carbon atoms are counted to determine the percentage of biobased content.

In the KBBPPS consortium, ECN heads the development of the biobased carbon content determination method. The method now has the status of a pre-standard. Interlaboratory tests have now been started to determine the reliability of the method. Once these have been completed, the method will be published as an official European standard.

Your can read more in our report:
Knowledge Based Bio-based Products' Pre-Standardization Public report on horizontal standard for bio-based carbon content determination

https://www.ecn.nl/news/item/ecn-publishes-report-on-european-pre-standard-for-biobased-carbon-content

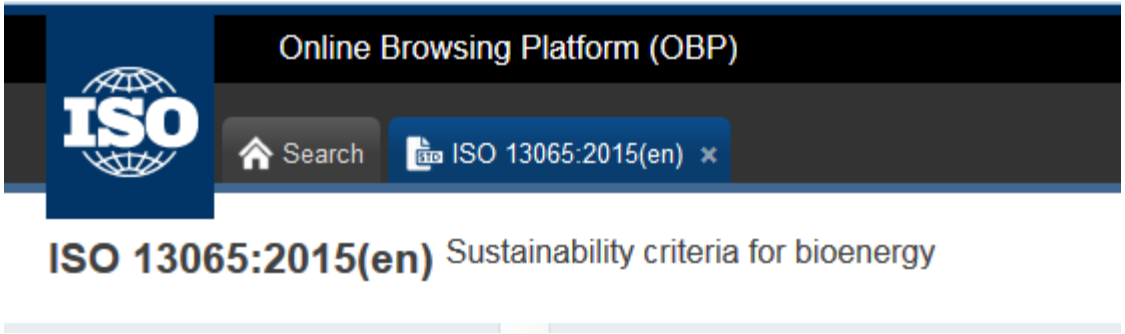
# Feedstock standards

ITC | STANDARDS MAP
YOUR ROADMAP TO SUSTAINABLE TRADE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Region | Asia | Africa | Australia & Oceania | Central America, Caribbean | Europe | North/ South America | Total |
| Agricul-tural products | 71 | 69 | 52 | 54 | 70 | 71/74 | 120 |
| Biomass | 37 | 37 | 29 | 32 | 36 | 37/38 | 52 |

Source: www.standardsmap.org , accessed 13th April 2016

# Bioenergy - Standards




CEN/TC 383

Date: 2016-03

EN 16214-3:2016/prA1:2016

CEN/TC 383

Secretariat: NEN

**Sustainability criteria for the production of biofuels and bioliquids for energy applications — Principles, criteria, indicators and verifiers — Part 3: Biodiversity and environmental aspects related to nature protection purposes**

*Einführendes Element — Haupt-Element — Teil 3: Teil-Titel*

*Élément introductif — Élément central — Partie 3 : Titre de la partie*

# Overview: Biobased products

PAS 600:2013

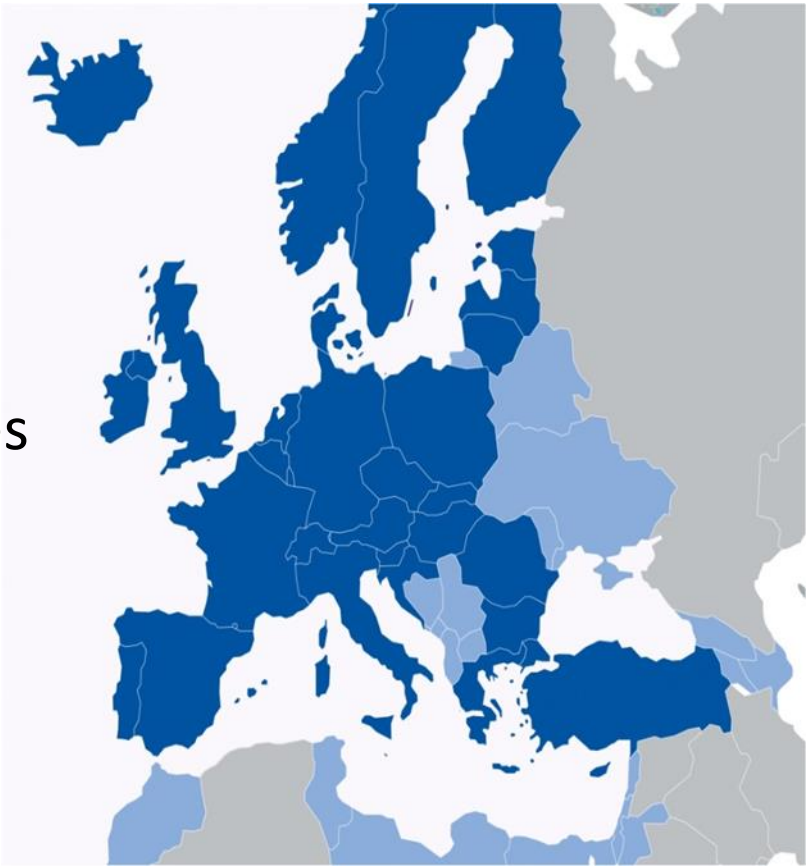
BSI Standards Publication

**Bio-based products –**

Guide to standards and claims

# CEN

- Recognised European Standardization Body by EU legislation
- National Standardization Bodies (NSBs) from 33 countries:
  - 28 EU countries, 3 EFTA, Turkey, FYROM



# CEN: Biobased products

**CEN/TC411**
**Biobased produkts**
Chairman: F. Petit
Sekret.: NEN (Niederlande)
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## CEN/TC411/WG1 Terminology
Convenor: H. Omloo
Sekret.: NEN (Niederlande)
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**DIN CEN/TR 16208:2011 (DIN SPEC 33928:2011)**
Biobased products- overview standards

**DIN EN 16575:2014**
Biobased products – Vocabulary

## CEN/TC411/WG2 Biosolvents
Convenor: A. Brossier
Sekret.: NEN (Niederlande)
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**Fpr CEN/TS 16766**
Biosolvents - Requirements and test methods

## CEN/TC411/WG3 Biobased content
Convenor: F. Bakker
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**DIN CEN/TS 16640 (DIN SPEC 35800)**
Determination biobased content

**CEN/TR 16721 (DIN SPEC 35802)**
Overview methods – Determination of the biobased content

**E DIN EN 16785**
Determination of the biobased carbon content

**Working documentst**
Overview mass balances and Book &Claim methodss

## CEN/TC411/WG4 Sustainability, LCA
Convenor: S. Eriksson
Sekretar.: SIS (Schweden)
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**E DIN EN 16760**
Biobased products Life Cycle Assessment

**E DIN EN 16751**
Biobased products – Sustainability criteria

## CEN/TC411/WG5 Certification
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**E DIN EN 16848 B2B reporting**
Template for B2B reporting and communication of characteristics

**Working document**
B2C communication

# CEN standards work finalised

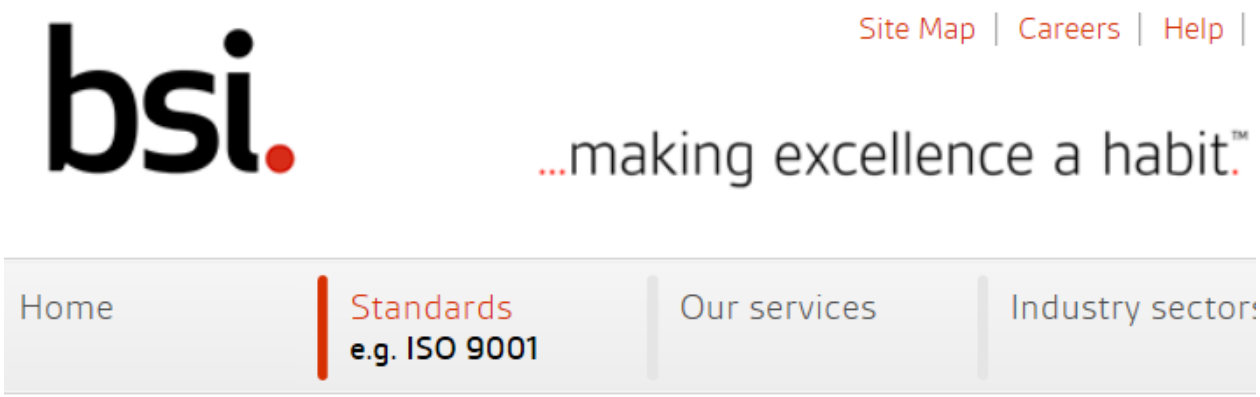
| CEN/TC 411 Published Standards | |
|---|---|
| **Reference, Title** | **Publication date** |
| CEN/TR 16721:2014 (WI=00411002)<br>Bio-based products - Overview of methods to determine the bio-based content | 2014-08-06 |
| CEN/TS 16640:2014 (WI=00411001)<br>Bio-based products - Determination of the bio based carbon content of products using the radiocarbon method | 2014-03-12 |
| CEN/TS 16766:2015 (WI=00411007)<br>Bio-based solvents - Requirements and test methods | 2015-03-25 |
| EN 16575:2014 (WI=00411003)<br>Bio-based products - Vocabulary | 2014-08-13 |
| EN 16751:2016 (WI=00411005)<br>Bio-based products - Sustainability criteria | 2016-04-06 |
| EN 16760:2015 (WI=00411006)<br>Bio-based products - Life Cycle Assessment | 2015-11-25 |
| EN 16785-1:2015 (WI=00411008)<br>Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis | 2015-12-16 |

# CEN standards work in progress

**CEN/TC 411 Work programme**

| Project reference | Status | Initial Date | Current Stage | Next Stage |
|---|---|---|---|---|
| FprCEN/TR 16957 (WI=00411010) Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase | Under Approval | 2014-10-09 | 2016-01-21 | 2016-04-21 |
| FprEN 16848 (WI=00411004) Bio-based products - Template for B2B reporting and communication of characteristics - Data sheet | Under Approval | 2014-05-14 | 2016-03-14 | 2016-06-16 |
| prEN 16640 (WI=00411009) Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method | Under Approval | 2014-07-01 | 2015-11-20 | 2016-07-20 |
| prEN 16785-2 (WI=00411011) Bio-based products - Bio-based content - Part 2: Determination of the bio-based content using the material balance method | Under Approval | 2015-01-05 | 2015-08-02 | 2016-04-04 |
| prEN 16935 (WI=00411013) Bio-based products - B2C reporting and communication - Requirements for claims | Under Approval | 2015-08-17 | 2016-02-19 | 2016-10-19 |

# Circular economy
# Fossil- meets bio-based



# Circular economy

**TECHNICAL BOARD**

**CEN/BT by correspondence**

| | | |
|---|---|---|
| **For information and possible comments** | **Issue date:** | 2016-03-23 |
| **Simultaneous circulation to CENELEC/BT** ☒ | **Deadline:** | 2016-04-19 |

**SUBJECT**

**Circular Economy -- Possible Ancillary Action on Sustainable Chemicals from secondary raw materials**

# Plastics - Biodegradability

## New ASTM Standard Tests and Supports Biodegradability of Plastics in Water

29.10.2015

*Laboratories will soon be able to use a new ASTM International standard to test and better understand biodegradability of plastics in marine environments.*

The new standard (soon to be published as D7991, Test Method for Determining Aerobic Biodegradation of Plastics Buried in Sandy Marine Sediment Under Controlled Laboratory Conditions) provides ways to simulate how plastics degrade in seawater-soaked sand.

- **Slide-deck – Part 2: (November 2016)**

The structure of CEN/TC411 with the respective working groups is displayed. It also shows the progress of the CEN standardisation activities TC411 in the field of biobased products.

Microplastics in the environment have gained huge interest. The integration of biodegradability and compostability might be a good opportunity for biobased products as it follows the cradle-to cradle concept and avoids the microplastic debate. Test methods to determine those functionalities (biodegradability and compostability) for different environmental compartments are shown. These methods are prerequisite for product labelling. Special environmental functionalities, such as "biodegradable in soils" are used by certification bodies.

An update (see slide deck 1) of relevant labels in the field of biobased products is provided; that encompasses relevant labels in Europe, Japan, Australia, the US but also countries and specific regions.

# AA2: Product Quality (Part 2)

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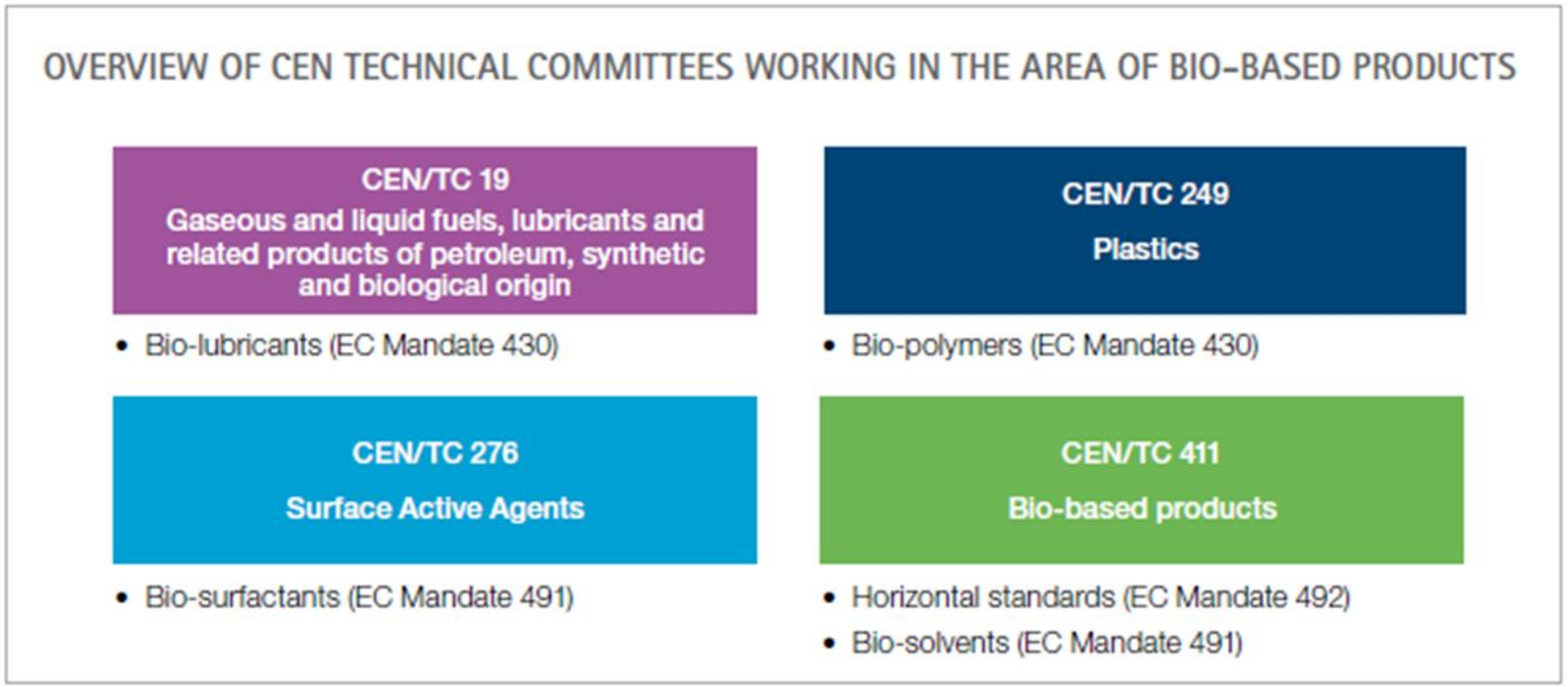
Thünen Institute of Agricultural Technology
Braunschweig, Germany

on behalf of IEA Task42

# Content

- CEN activity areas and update CEN TC 411
- Biobased products standards
- Consumer concerns
- Biodegradability – opportunity (?)
- Relation test methods and labelling
- Test methods
- Overview labels
- Summary

# CEN – biobased products



# CEN: Biobased products

**CEN/TC411**
**Biobased produkts**
Chairman: F. Petit
Sekret.: NEN (Niederlande)
harmen.willemse@nen.nl

## CEN/TC411/WG1 Terminology
Convenor: H. Omloo
Sekret.: NEN (Niederlande)
harmen.willemse@nen.nl

**DIN CEN/TR 16208:2011 (DIN SPEC 33928:2011)**
Biobased products- overview standards

**DIN EN 16575:2014**
Biobased products – Vocabulary

## CEN/TC411/WG2 Biosolvents
Convenor: A. Brossier
Sekret.: NEN (Niederlande)
ortwin.cortenoble@nen.nl

**Fpr CEN/TS 16766**
Biosolvents - Requirements and test methods

## CEN/TC411/WG3 Biobased content
Convenor: F. Bakker
Sekret.: NEN (Niederlande)
harmen.willemse@nen.nl

**DIN CEN/TS 16640 (DIN SPEC 35800)**
Determination biobased content

**CEN/TR 16721 (DIN SPEC 35802)**
Overview methods – Determination of the biobased content

**E DIN EN 16785**
Determination of the biobased carbon content

**Working documentst**
Overview mass balances and Book &Claim methodss

## CEN/TC411/WG4 Sustainability, LCA
Convenor: S. Eriksson
Sekretar.: SIS (Schweden)
Maria.gustafsson@sis.se

**E DIN EN 16760**
Biobased products Life Cycle Assessment

**E DIN EN 16751**
Biobased products – Sustainability criteria

## CEN/TC411/WG5 Certification
Convenor: H. Vooijs
Sekret.: NEN (Niederlande)
harmen.willemse@nen.nl

**E DIN EN 16848 B2B reporting**
Template for B2B reporting and communication of characteristics

**Working document**
B2C communication

# CEN standards work finalised

| | | | |
|---|---|---|---|
| | CEN/TC 411 | (WI=00411015)<br>Bio-based products - Oxygen content - Determination of the oxygen content using an elemental analyser | Under Drafting |
| | CEN/TC 411 | CEN/TR 16721:2014 (WI=00411002)<br>Bio-based products - Overview of methods to determine the bio-based content | Published |
| X | CEN/TC 411 | CEN/TR 16957:2016 (WI=00411010)<br>Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase | Published |
| | CEN/TC 411 | CEN/TS 16640:2014 (WI=00411001)<br>Bio-based products - Determination of the bio based carbon content of products using the radiocarbon method | Published |
| | CEN/TC 411 | CEN/TS 16766:2015 (WI=00411007)<br>Bio-based solvents - Requirements and test methods | Published |
| | CEN/TC 411 | EN 16575:2014 (WI=00411003)<br>Bio-based products - Vocabulary | Published |
| | CEN/TC 411 | EN 16751:2016 (WI=00411005)<br>Bio-based products - Sustainability criteria | Published |
| | CEN/TC 411 | EN 16760:2015 (WI=00411006)<br>Bio-based products - Life Cycle Assessment | Published |
| | CEN/TC 411 | EN 16785-1:2015 (WI=00411008)<br>Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis | Published |
| X | CEN/TC 411 | EN 16848:2016 (WI=00411004)<br>Bio-based products - Requirements for Business to Business communication of characteristics using a Data Sheet | Published |

# CEN standards work in progress

| | | |
|---|---|---|
| CEN/TC 411 | FprEN 16640 (WI=00411009)<br>Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method | Under Approval |
| CEN/TC 411 | FprEN 16935 (WI=00411013)<br>Bio-based products - Requirements for Business-to-Consumer communication and claims | Under Approval |
| CEN/TC 411 | prEN 16766 (WI=00411016)<br>Bio-based solvents - Requirements and test methods | Under Enquiry |
| CEN/TC 411 | prEN 16785-2 (WI=00411011)<br>Bio-based products - Bio-based content - Part 2: Determination of the bio-based content using the material balance method | Under Enquiry |

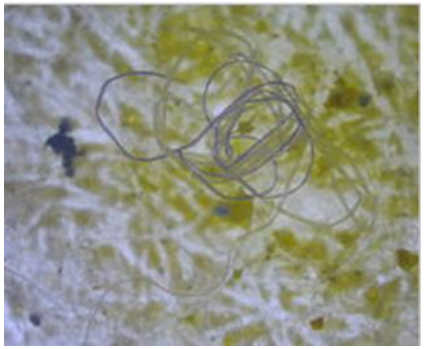
# Consumer concern

Environment

## Microplastics in the sea a growing threat to human health, United Nations warns

More than a quarter of fish in markets in Indonesia and California contain plastic particles

Tiny zooplankton like this one readily ingest microplastics in marine habitats. Credit: Matthew Cole, et al., courtesy of the journal "Environmental Science & Technology."



Geophysical Research Abstracts
Vol. 18, EGU2016-17432-2, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

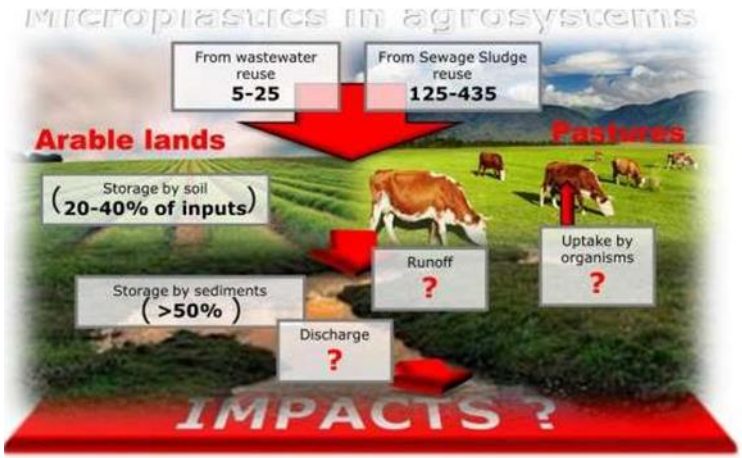
**Potential risk of microplastics transportation into ground water**

Pollution: Do microplastics spill on to farm soils?

Luca Nizzetto, Sindre Langaas & Martyn Futter

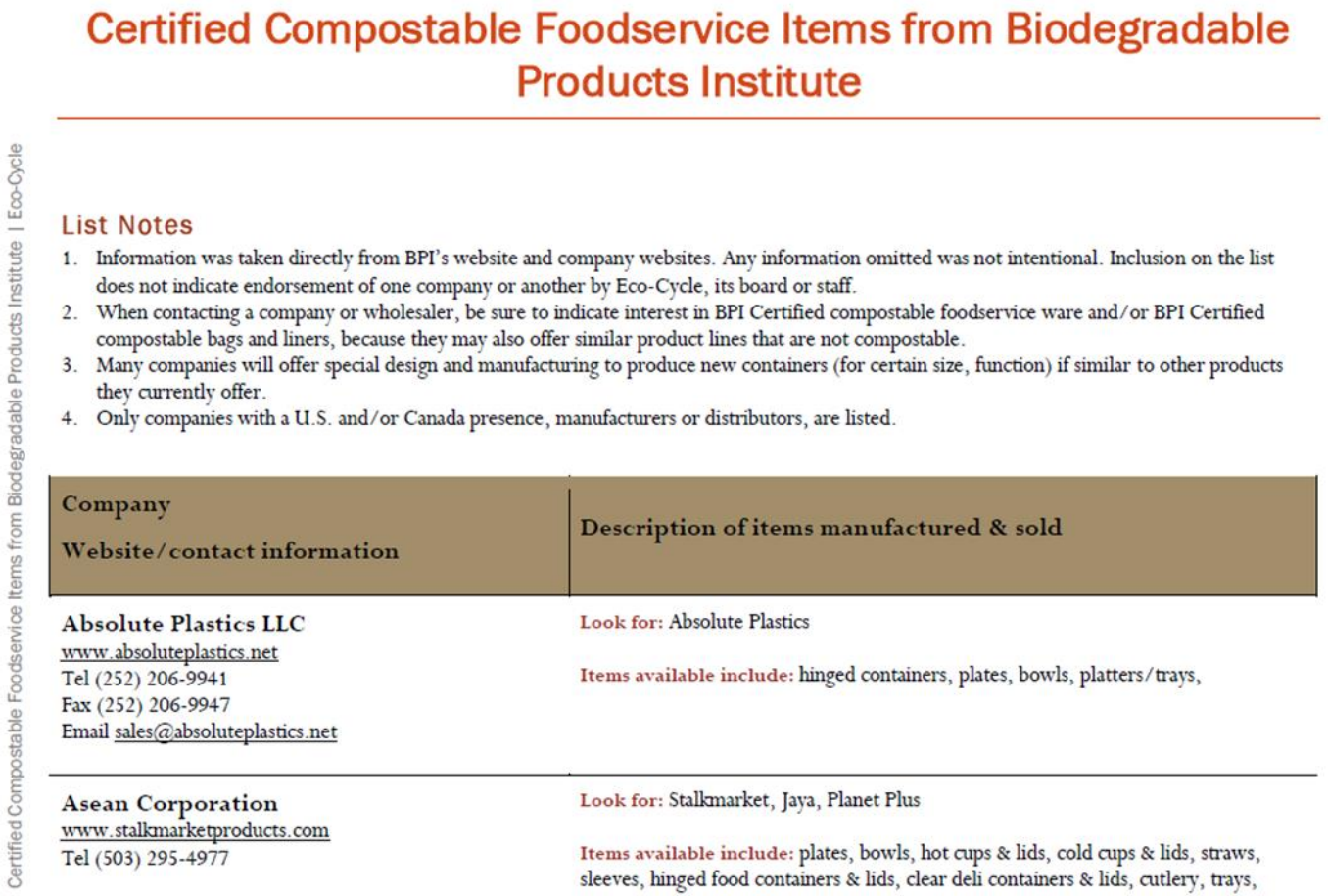
Affiliations | Corresponding author

*Nature* **537**, 488 (22 September 2016) | doi:10.1038/537488b




**Estimated inputs of MPs to agrosystems (in t $y^{-1}$ per million of people). Data in bracket are preliminary estimates obtained from model simulations.**

# Biodegradability –
## Opportunity for biobased polymers?



Certified Compostable Foodservice Items from Biodegradable Products Institute

### List Notes

1. Information was taken directly from BPI's website and company websites. Any information omitted was not intentional. Inclusion on the list does not indicate endorsement of one company or another by Eco-Cycle, its board or staff.
2. When contacting a company or wholesaler, be sure to indicate interest in BPI Certified compostable foodservice ware and/or BPI Certified compostable bags and liners, because they may also offer similar product lines that are not compostable.
3. Many companies will offer special design and manufacturing to produce new containers (for certain size, function) if similar to other products they currently offer.
4. Only companies with a U.S. and/or Canada presence, manufacturers or distributors, are listed.

| Company<br>Website/contact information | Description of items manufactured & sold |
|---|---|
| **Absolute Plastics LLC**<br>www.absoluteplastics.net<br>Tel (252) 206-9941<br>Fax (252) 206-9947<br>Email sales@absoluteplastics.net | **Look for:** Absolute Plastics<br><br>**Items available include:** hinged containers, plates, bowls, platters/trays, |
| **Asean Corporation**<br>www.stalkmarketproducts.com<br>Tel (503) 295-4977 | **Look for:** Stalkmarket, Jaya, Planet Plus<br><br>**Items available include:** plates, bowls, hot cups & lids, cold cups & lids, straws, sleeves, hinged food containers & lids, clear deli containers & lids, cutlery, trays, |

Certified Compostable Foodservice Items from Biodegradable Products Institute | Eco-Cycle

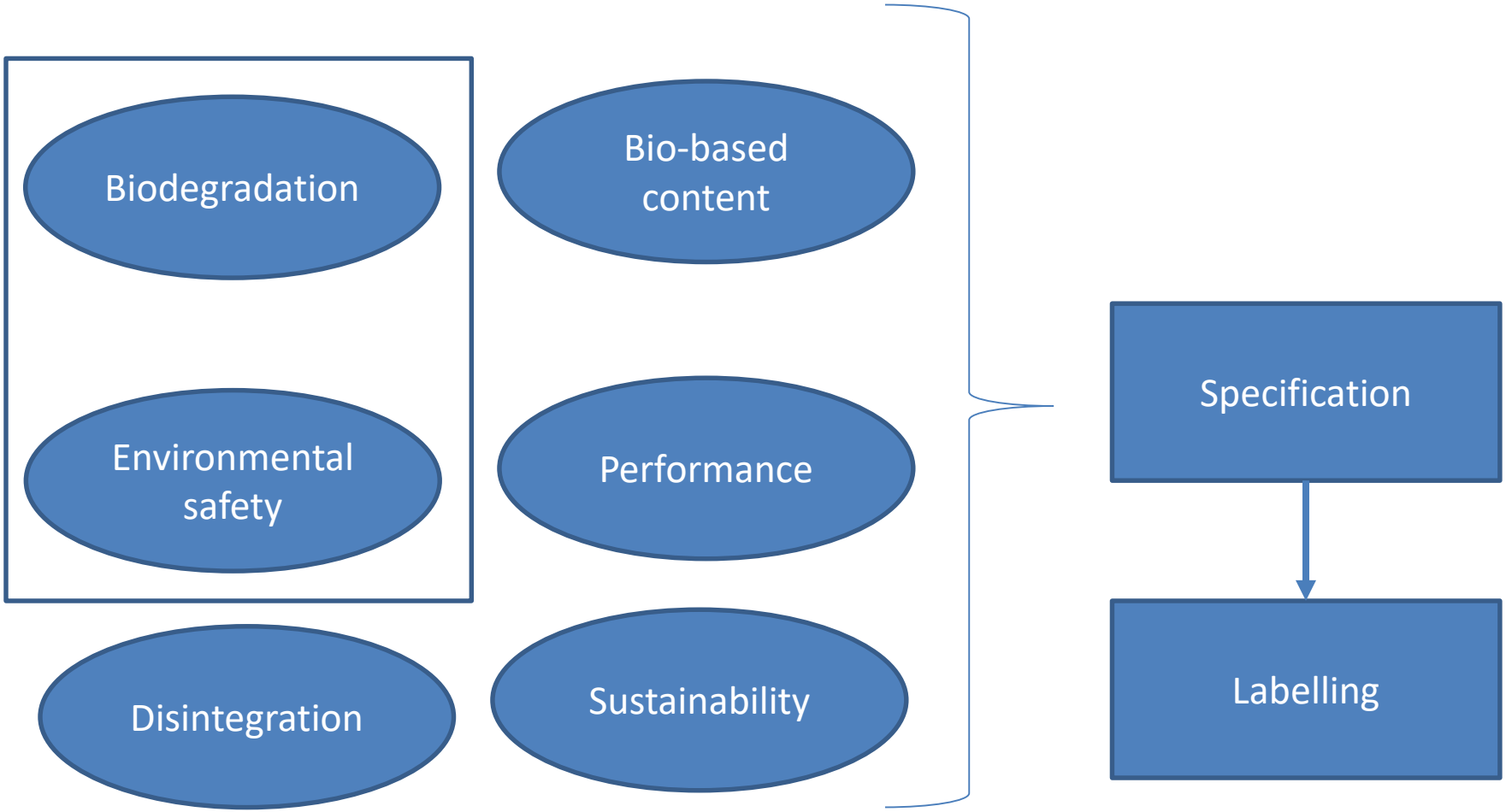
For more please look at: http://www.ecocycle.org/specialreports/microplasticsincompost

# Biodegradability – easy?

Test methods for

- Fresh water
- Marine environment
- Anaerobic environment
- Sediment
- Soil
- Compost

# Test methods -> labelling



# Method - certification

| | | |
|---|---|---|
| VINÇOTTE | **VINCOTTE**<br>**OK biodegradable SOIL : Initial acceptance tests**<br>Doc Ref : **OK10-e** Edition : C<br>Application Date : 2012-03-01 Page : 1 / 5<br>Replace : Edition B | SOIL OK bio-degradable VINÇOTTE |
| **Program OK 10**<br>**Bio products – degradation in soil** | | |

| | | |
|---|---|---|
| VINÇOTTE | **VINCOTTE**<br>**OK biodegradable MARINE : Initial acceptance tests**<br>Doc Ref : **OK12-e** Edition : A [1]<br>Application Date : 2015-03-02 Page : 1 / 5<br>Replace : - | MARINE OK bio-degradable VINÇOTTE |
| **Program OK 12**<br>**Bio products – degradation in seawater** | | |

# Some test methods

International standard ISO 14851: "*Determination of the ultimate aerobic biodegradability of plastic material in an aqueous medium - Method by measuring the oxygen demand in a closed respirometer*"

International standard ISO 14852: "*Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide*"

International standard ISO 14855: "*Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide*"

American standard ASTM D 5338: "*Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions. Incorporating Thermophilic Temperatures*"

American Standard ASTM D 6400: "*Standard Specification for Labelling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities*"

American standard ASTM D 6691: "*Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum*"

European standard EN 13193: "*Packaging. Packaging and the environment. Terminology*"

European standard EN 13137: "*Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments*"

European standard EN 13432 : "*Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging*"

Document with reference OPPTS 850.1010: "*Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids*"

Document with reference OECD 202: "*Daphnia sp., Acute Immobilisation Test*"

Document with reference OPPTS 850.1075: "*Fish Acute Toxicity Test, Freshwater and Marine*"

Document with reference OECD 203: "*Fish, Acute Toxicity Test*"

Document with reference OPPTS 850.5400: "*Algal Toxicity, Tiers I and II*"

Document with reference OECD 201: "*Freshwater Alga and Cyanobacteria, Growth Inhibition Test*"

Document with reference OECD 306: "*Biodegradability in Seawater*"

International standard ISO 16221: "*Water quality – Guidance for determination of biodegradability in the marine environment*"

International standard ISO 18830: "*Plastics – Test Method for Determining Aerobic Biodegradation of Plastic Materials sunk at the sea water / sandy sediment interface*"

# More test methods

THÜNEN

International standard ISO 17556: "*Determination of the ultimate aerobic biodegradability in soil by measuring the oxygen demand*"

International standard ISO 11266: "*Soil quality - Guidance on laboratory testing for biodegradation of organic chemicals in soil under aerobic conditions*"

International standard ISO 14851: "*Determination of the ultimate aerobic biodegradability of plastic material in an aqueous medium - Method by measuring the oxygen demand in a closed respirometer*"

International standard ISO 14852: "*Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide*"

European standard EN 29408: "*Water quality. Evaluation in an aqueous medium of the "ultimate" aerobic biodegradability of organic compounds: method by determining the oxygen demand in a closed respirometer*"

European standard EN 29439: "*Water quality. Evaluation in an aqueous medium of the "ultimate" aerobic biodegradability of organic compounds: method by analysis of released carbon dioxide*"

International standard ISO 9408: "*Water quality - Evaluation in aqueous medium of the "ultimate" aerobic biodegradability of organic compounds - Method by determining of the oxygen demand in a closed respirometer*"

International standard ISO 9439: "*Water quality - Evaluation in aqueous medium of the "ultimate" aerobic biodegradability of organic compounds - Method by analysis of released carbon dioxide*"

American standard ASTM D.5271: "*Test Method For Assessing the Aerobic Biodegradation of Plastic Materials in an Activated Sludge Wastewater-Treatment System*"

American standard ASTM D.5988: "*Standard Test Method for Determining Aerobic Biodegradation in Soil of Plastic Materials or Residual Plastic Materials After Composting*"

Document with reference OECD 301 C: *"Aquatic respirometric biodegradation test (MITI)"*

Document with reference OECD 301 B: "*CO2 Evolution (Modified Sturm Test)*"

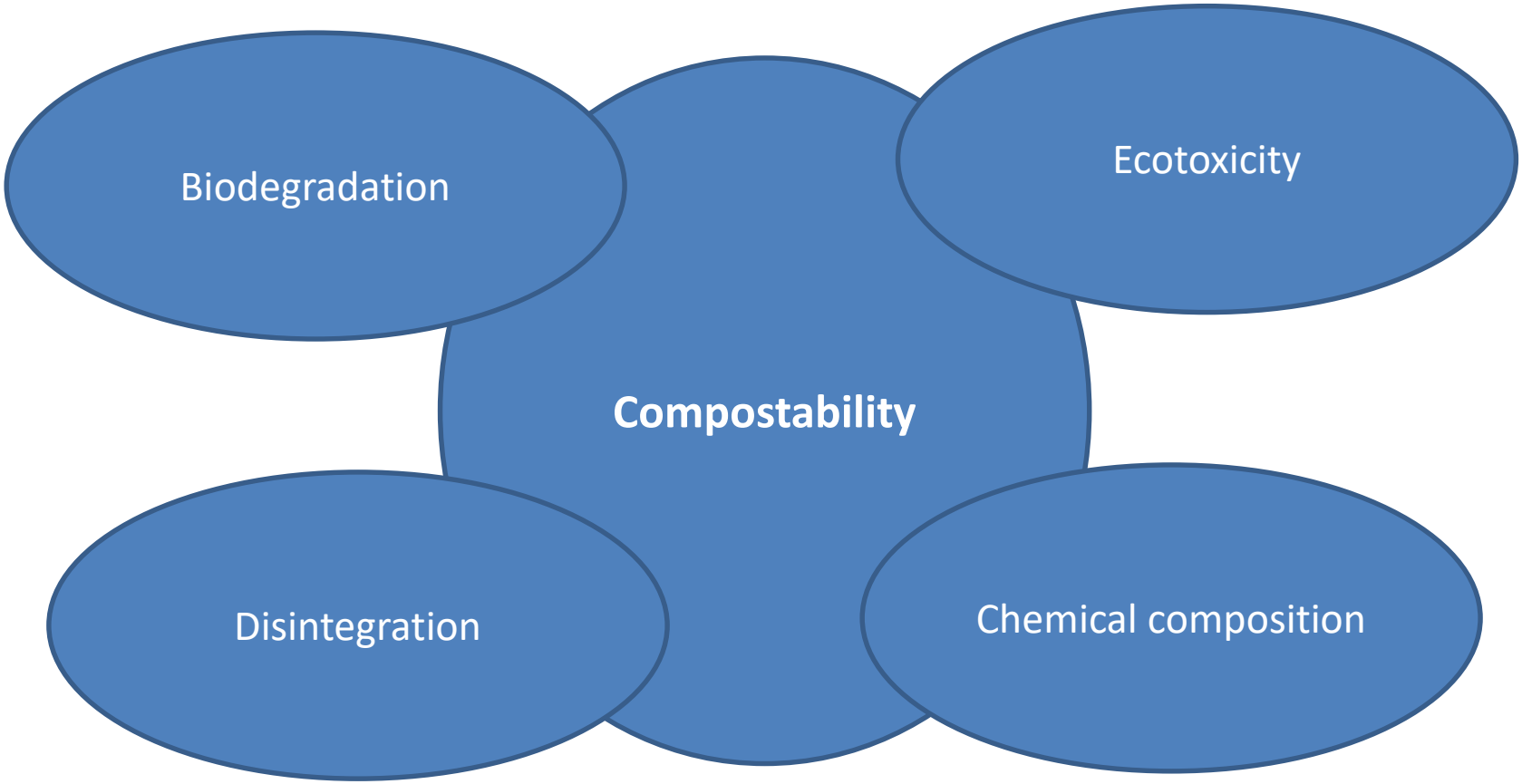
American standard ASTM D.6691: "*Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment by a Defined Microbial Consortium or Natural Sea Water Inoculum*"

Document with reference OECD 208: "*Terrestrial Plant Test: Seedling Emergence and Seedling Growth Test*"

European standard EN 13193: *"Packaging. Packaging and the environment. Terminology"*

European Standard EN 13137: *"Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments"*

# Compostability



# Labels

| Logo | Organization | Norm | Symbol |
|---|---|---|---|
| **Seedling logo** | European Bioplastics | EN 13432, ASTM D 6400, EN 14995 and ISO 17088 | |
| **OK compost logo** | Vinçotte | EN 13432 | |
| **DIN-Geprüft Compostable logo** | DIN CERTCO | EN 13432, ASTM D 6400, EN 14995, ISO 17088 and AS 4736 | |
| **Compostable logo** | Biodegradable Products Institute (BPI) | ASTM D 6400 and ASTM D 6868 | |
| **Cedar Grove Composting logo** | Cedar Grove | based on ASTM D6400 and ASTM D6868 with additionally mandatory full-scale test | |
| **GreenPla logo** | Japan Bioplastics Association (JBPA) | Green PLA certification scheme | |

| Logo | Organization | Norm | Symbol |
|---|---|---|---|
| **Australian seedling logo** | Australasian Bioplastics Association (ABA) | AS 4736 | |
| **National logo in Italy** | Consorzio Italiano Compostatori (CIC) | based on EN 13432 with additionally mandatory full-scale test | |
| **National logo in Finland** | Jätelaitosyhdistys | EN 13432 | |
| **National logo in Sweden** | SP Technical Research Institute of Sweden | SPCR 141 | |
| **National logo in Spain (Catalonia)** | Departament de Medi Ambient i Habitatge | EN 13432 and EN 14995 | |

# Summary

- CEN TC/411 progressing
- Focus were on biodegradability (consumer products as food packaging and „niche products“ such as mulching foil)
- Numerous standardised test methods testing degradation in soil still challenging
- Composting tests → Biodegradation time in natural environment (?)
- Mostly polymers, for bio-lubricants and bio-solvents room for improvements

- **Slide-deck – Part 3 (May 2017**)

Summarises the progress of TC/493. It also shows the final decision concerning indirect effects in bioenergy standards in Europe (CEN/TC 383).

Driven by the Action Plan for the circular economy in Europe the question of the use of secondary raw materials for "sustainable chemicals" appeared. That has led to an enquiry about the need for a standard for "Sustainable Chemicals". Stakeholder consultation has taken place, the presentation contains an overview about relevant stakeholders; some stakeholders relevant for biorefinery activities are emphasised. NEN the Dutch Standardisation body has got a pre-mandate from the EU-Commission to map relevant existing standards in order to explore whether a new standard is needed for sustainable chemicals. These activities should be finalised in 2018 and reported to the EU-commission. Whether a decision will be taken in 2018 regarding the need for a standard for sustainable chemicals remains to be seen.

# AA2: Product Quality (Part 3)

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on behalf of IEA Task42

# CEN/TC 383: Sustainably produced biomass for energy applications

**CEN/TC 383 Published Standards**

| Reference, Title | Publication date |
|---|---|
| CEN/TS 16214-2:2014 (WI=00383010) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 2: Conformity assessment including chain of custody and mass balance | 2014-01-15 |
| EN 16214-1:2012 (WI=00383001) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 1: Terminology | 2012-08-29 |
| EN 16214-3:2012 (WI=00383009) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 3: Biodiversity and environmental aspects related to nature protection purposes | 2012-08-29 |
| EN 16214-4:2013 (WI=00383008) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 4: Calculation methods of the greenhouse gas emission balance using a life cycle analysis approach | 2013-01-16 |

# CEN/TC 383/WG3 Biodiversity and environmental aspects

**Final draft recommendation to CEN/TC 383/WG 3 regarding iLUC and indirect effects (CEN/TC 383/WG 3 N 230)**

| | |
|---|---|
| Datum des Dokumentes | 2017-02-20 |
| Aktion | Info |

CEN/TC 383/WG 3 also discussed the state-of-science regarding indirect effects to see whether there are other feasible areas for standardisation at this time. Given that the EN 16214-series has so far only included topics considered in Directive 2009/28/EC, and noting that science is not unanimous regarding ILUC, WG 3 does not recommend any further work regarding indirect effects at this stage. This is also taking into consideration the recent experiences within ISO/PC 248 *Sustainability criteria for bioenergy*, where it was not possible to reach consensus regarding indirect effects. However, CEN/TC 383 could include ILUC considerations in CEN/TC 383's work as soon as more EC policy guidance exists.

# Driver

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**Closing the loop - An EU action plan for the Circular Economy**

Bio-based materials, i.e. those based on biological resources (such as wood, crops or fibres) can be used for a wide range of products (construction, furniture, paper, food, textile, chemicals, etc...) and energy uses (e.g. biofuels). The bioeconomy hence provides alternatives to fossil-based products and energy, and can contribute to the circular economy. Bio-based materials can also present advantages linked to their renewability, biodegradability or compostability. On the other hand, using biological resources requires attention to their lifecycle environmental impacts and sustainable sourcing. The multiple possibilities for their use can also generate competition for them and create pressure on land-use. The Commission will examine the contribution of its 2012 a Bioeconomy Strategy[43] to the circular economy and consider updating it if necessary.

# Circular economy

| TECHNICAL BOARD | | |
|---|---|---|
| CEN/BT by correspondence | | |
| For information and possible comments | Issue date: | 2016-03-23 |
| Simultaneous circulation to CENELEC/BT ☒ | Deadline: | 2016-04-19 |

**SUBJECT**

**Circular Economy -- Possible Ancillary Action on Sustainable Chemicals from secondary raw materials**

# Pre-mandate „Sustainable Chemicals“

- Formally established 2017
- Coordinator NEN
- Standard screening worldwide
- Currently five task groups
  Raw material
  Production/Design
  Production Processes
  Consumption/Labelling
  Recycling/End of life/waste management
- Report to the EU Commission Spring 2018
- Decision whether a new standard on sustainable chemicals is required

# Strategy paper Chemical Industry 2017

**Sustainability has become a vital part of many business strategies across industries, and that has prompted growing interest in the circular economy—including among European chemical companies. The advent of the circular economy is likely to lead to significant changes for the industry, along with fundamental challenges. But it could present a major opportunity for the European chemical industry, and for Europe overall.**

# Stakeholder consultation

EUROPEAN COMMISSION
Internal Market, Industry, Entrepreneurship and SMEs Directorate-General
Consumer, Environmental and Health Technologies
Unit D.1: REACH

Environment Directorate –General
Circular Economy and Green Grow
Unit B.2: Sustainable Chemicals

**STAKEHOLDER CONSULTATION PAPER**

**CHEMICAL, PRODUCT, WASTE INTERFACE**

**INSTRUCTIONS FOR THE CONSULTATION**

The present document should be read together with the Roadmap on "Analysis of the interface between chemicals, products and waste legislation and identification of policy options" which was published on 27 January 2017 at the following website:

http://ec.europa.eu/smart-regulation/roadmaps/docs/plan_2016_116_cpw_en.pdf

Due date 07/07/2017

| Stakeholders |
| --- |
| The Joint Research Centre of the European Commission |
| Different relevant technology platforms |
| Workers (ETUI-REHS) |
| The European Renewable Raw Materials Association (ERRMA) |
| COPA-COGECA |
| EFAR – European Federation for agricultural recycling |
| EBA- European Biogas Association |
| Municipal Waste Europe |
| EUROFEMA – European Organic Fertilizers Manufacturers Association |
| European Biomass Industry Association |
| CEPI – Confederation of European Paper Industries |
| CEWEP |
| Circular Economy 100 Platform |
| Public Private Partnerships (PPPs) |
| Joint Undertakings |
| Organisations representing consumers' interests (ANEC) |
| Environmental protection (ECOS) |
| SMEs (NORMAPME), |
| European Chemical Industry Council (CEFIC) |
| European Bioplastics |
| European Association for Bioindustries (EuropaBio) |
| Council of European Municipalities and Regions, |
| EUREAU |
| EURO COOP – European Community of Consumer Cooperatives |
| FEAD - European Federation of Waste Management and Environmental Services |
| EFPRA – European Animal By-product Processing Sector |
| ESPP – European Sustainable Phosphorus Platform |
| ECOFI- European Consortium Organic-Based Fertilizer Industry |
| EUROSLAG – European Association of Metallurgical Slag Products and Processors |
| European Biomass Industry Association |
| Fédération Internationale du Recyclage (FIR), |
| European Recovered Fuel Organisation (ERFO |
| CEPF - Confederation of European Forest Owners |
| Fertilizer Europe |
| European Compost Network |
| Ellen MacArthur Foundation |
| Relevant European Technology Platforms (ETPs) |

- **Slide-deck – Part 4: (October 2017)**

Slide-deck 4 shows the existing and newly approved standards for biobased products. It also shows standards concerning "sustainably produced biomass for energy applications" that might be adapted in the future due to the revision of the European Energy Directive.

The ongoing activities for the pre-standardisation activity for "Sustainable chemicals from secondary raw materials" are also displayed. In 2017, Japan has updated various standards/test methods for the determination of aerobic biodegradability of chemical substances and plastic materials in different environments or conditions.

Labels for the compostability and biodegradability are shown together with the respective test methods in different countries as well as certification bodies from the US, Japan and Europe.

The biobased content can be expressed in different ways (biobased carbon content, organic matter content and biobased content); the corresponding test methods for the different claims are shown. Furthermore an example is provided for compostable and biodegradable products and several industrial sectors in the US, Japan and Europe.

# AA2: Product Quality (Part 4)

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Braunschweig, Germany

on behalf of IEA Task42

# European ongoing Initiative

**Stakeholder Conference:**

**'Reinventing Plastics – Closing the Circle'**

***26 September 2017, Brussels***

## Venue

Albert Borschette Conference Centre, Room 0A, Rue Froissart 36, 1040 Brussels.

## Introduction and objectives

Plastic is an important material for our economy. However, its growing production brings with it a series of challenges related to their production, use, and end-of-life that need to be addressed.

In its 'EU action plan for the Circular Economy' (COM (2015) 614 final), the European Commission set out a commitment to develop a plastics strategy due to be adopted in late 2017 through a Commission Communication. This strategy intends to support and complement the existing acquis and tackle the interrelated problems of fossil feedstock dependence, recycling and reuse and plastics leakage into the environment. The strategy is being informed by a number of technical studies and a wide variety of stakeholder engagement activities.

DRAFT

# Content

- Standards biobased products
  - Finalised
  - In preparation
- Standards sustainability product biomass for energy applications
  - Finalised
  - In preparation
- Labels
- Sustainable Chemcials

# Biobased products – Standards overview

| CEN/TC 411 Subcommittees and Working Groups | |
|---|---|
| **Working group** | **Title** |
| CEN/TC 411/WG 1 | Terminology |
| CEN/TC 411/WG 2 | Bio-solvents |
| CEN/TC 411/WG 3 | Bio-based content |
| CEN/TC 411/WG 4 | Sustainability criteria, life cycle analysis and related issues |
| CEN/TC 411/WG 5 | Certification and declaration tools |

# Biobased products – Standards 1

**CEN/TC 411/WG 1 Published Standards**

| Reference, Title | Publication date |
|---|---|
| EN 16575:2014 (WI=00411003)<br>Bio-based products - Vocabulary | 2014-08-13 |

**CEN/TC 411/WG 2 Published Standards**

| Reference, Title | Publication date |
|---|---|
| CEN/TS 16766:2015 (WI=00411007)<br>Bio-based solvents - Requirements and test methods | 2015-03-25 |

# Biobased products – Standards 2

**CEN/TC 411/WG 3 Published Standards**

| Reference, Title | Publication date |
|---|---|
| CEN/TR 16721:2014 (WI=00411002)<br>Bio-based products - Overview of methods to determine the bio-based content | 2014-08-06 |
| → EN 16640:2017 (WI=00411009)<br>Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method | 2017-02-22 |
| → EN 16640:2017/AC:2017 (WI=00411C01)<br>Bio-based products - Bio-based carbon content - Determination of the bio-based carbon content using the radiocarbon method | 2017-07-12 |
| EN 16785-1:2015 (WI=00411008)<br>Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis | 2015-12-16 |

# Biobased products – Standards 3

**CEN/TC 411/WG 4 Published Standards**

| Reference, Title | Publication date |
|---|---|
| CEN/TR 16957:2016 (WI=00411010)<br>Bio-based products - Guidelines for Life Cycle Inventory (LCI) for the End-of-life phase | 2016-09-07 |
| EN 16751:2016 (WI=00411005)<br>Bio-based products - Sustainability criteria | 2016-04-06 |
| EN 16760:2015 (WI=00411006)<br>Bio-based products - Life Cycle Assessment | 2015-11-25 |

# Biobased products – Standards 4

**CEN/TC 411/WG 5 Published Standards**

| Reference, Title | Publication date |
|---|---|
| EN 16848:2016 (WI=00411004)<br>Bio-based products - Requirements for Business to Business communication of characteristics using a Data Sheet | 2016-11-09 |
| → EN 16935:2017 (WI=00411013)<br>Bio-based products - Requirements for Business-to-Consumer communication and claims | 2017-05-10 |

# Biobased products – forthcoming

**CEN/TC 411/WG 2 Work programme**

| Project reference | Status | Initial Date | Current Stage | Next Stage | Forecasted voting date |
|---|---|---|---|---|---|
| EN 16766:2017 (WI=00411016) Bio-based solvents - Requirements and test methods | Approved | 2016-06-02 | 2017-09-06 | 2017-11-01 | 2017-01-18 |

**CEN/TC 411/WG 3 Work programme**

| Project reference | Status | Initial Date | Current Stage | Next Stage |
|---|---|---|---|---|
| FprEN 16785-2 (WI=00411011) Bio-based products - Bio-based content - Part 2: Determination of the bio-based content using the material balance method | Under Approval | 2015-01-05 | 2017-09-28 | 2017-11-23 |
| (WI=00411015) Bio-based products - Oxygen content - Determination of the oxygen content using an elemental analyser | Under Drafting | 2016-05-27 | 2016-05-27 | 2016-11-28 |

# CEN/TC 383: Sustainably produced biomass for energy applications

**CEN/TC 383 Published Standards**

| Reference, Title | Publication date |
|---|---|
| CEN/TS 16214-2:2014 (WI=00383010) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 2: Conformity assessment including chain of custody and mass balance | 2014-01-15 |
| EN 16214-1:2012 (WI=00383001) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 1: Terminology | 2012-08-29 |
| EN 16214-3:2012 (WI=00383009) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 3: Biodiversity and environmental aspects related to nature protection purposes | 2012-08-29 |
| EN 16214-4:2013 (WI=00383008) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 4: Calculation methods of the greenhouse gas emission balance using a life cycle analysis approach | 2013-01-16 |

Update after EU-RED II required?

# CEN/TC 383: Sustainably produced biomass for energy applications

**CEN/TC 383 Work programme**

| Project reference | Status | Initial Date | Current Stage | Next Stage |
|---|---|---|---|---|
| prCEN/TS 16214-2 rev (WI=00383016) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 2: Conformity assessment including chain of custody and mass balance | Under Drafting | 2017-09-29 | 2017-09-29 | 2018-03-29 |
| prEN 16214-1 rev (WI=00383015) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 1: Terminology | Under Drafting | 2017-09-29 | 2017-09-29 | 2018-01-29 |
| prEN 16214-4 rev (WI=00383017) Sustainability criteria for the production of biofuels and bioliquids for energy applications - Principles, criteria, indicators and verifiers - Part 4: Calculation methods of the greenhouse gas emission balance using a life cycle analysis approach | Under Drafting | 2017-09-29 | 2017-09-29 | 2018-01-29 |

# Pre-mandate „Sustainable Chemicals“ I

- Formally established 2017
- Coordinator NEN
- Standard screening worldwide
- Currently five task groups
  Raw material
  Production/Design
  Production Processes
  Consumption/Labelling
  Recycling/End of life/waste management
- Report to the EU Commission Spring 2018
- Decision whether a new standard on sustainable chemicals is required

Work in progress
- Currently more than 1000 relevant standards are identified (worldwide)
- Classification of the standards according to green chemistry principles

# Pre-mandate „Sustainable Chemicals“ II

Relevant standards for bio-based chemicals, particularly biopolymers

- Determination of the biogenic carbon content
- Compostability
- Biodegradability in soil(s)
- Biodegradability in the marine environment
- Quality requirements recyclates

# Test methods –Japan BioPlastics updated 2017

- OECD 301C (Modified MITI Test – Ready Biodegradability)
  Chemical substances: Aerobic biodegradability testing method using activated sludge
- ISO 14851: Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium (Method by measuring the oxygen demand in a closed respirometer)
- ISO 14852: Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium (Method by analysis of evolved carbon dioxide)
- ISO 14855 -1: Determination of the ultimate aerobic biodegradability and disintegration of plastic materials under controlled composting conditions (Method by analysis of evolved carbon dioxide, general method)
- ISO 14855-2: Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions (Method by analysis of evolved carbon dioxide, gravimetric measurement)

# Labels – compostability, biodegradation

US, UK, PL,NL, GER

Organic fibres, and restricted processing

?

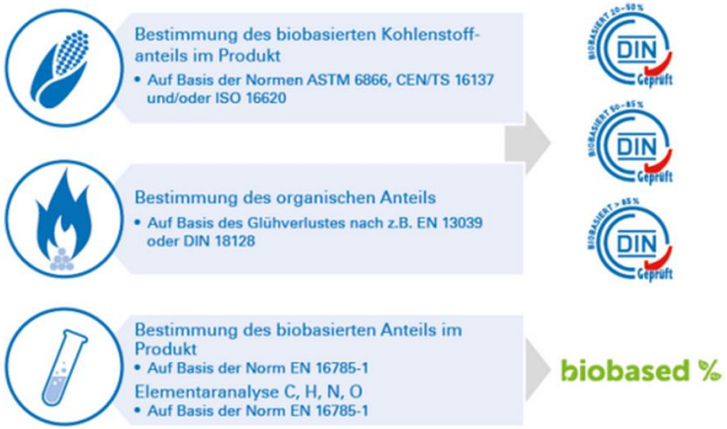
Test methods:

- ASTM D 6400 (US)
- DIN EN 13432 (Europe)
- AS 5810 (Australia)
- T51 – 800 (France)
- ASTM D 5338 (plastics, aerobic biodegradation)
- ISO 16929 (plastics disintegration)

Relevant bodies:

- BPI, US
- Vincotte, Belgium
- DIN CERTCO, Germany
- Jätelaitosyhdistys, Finland
- ADEME, France
- Japan BioPlasticsAssociation (registration is required but not certification)

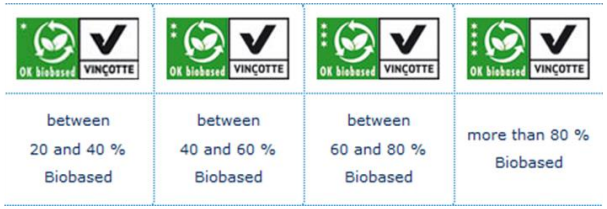
# Labels – Biobased content




Biobased carbon content

Organic matter content (ignition lost)

Biobased content (elementary analysis)



# Product- compostable or biodegradable

Company/products listing:
http://bpiworld.org/BPI-Public/Approved/1.html
http://www.greengood.com/products/pla_products.htm
https://greenpaperproducts.com/biodegradable-products.aspx

- Food service products
- Bags
- Packaging
- Resins
- Consumer products
- Agriculture

# Example 1 - GreenGood

The GreenGood® product line is constantly being updated with new products continuing to be developed to meet the needs of the international foodservice marketplace.

- GreenGood® products are environmentally-friendly disposable foodservice products.
- GreenGood® products are made from sustainable renewable resources that are 100% compostable.
- GreenGood® products are manufactured in state of the art facilities in China, that are environmentally responsible with a small Eco-footprint, and are also socially responsible to their work force.
- GreenGood® products carry all required U.S. and European product certifications, including FDA approval
- GreenGood® Ingeo® PLA products are made from NatureWorks PLA. All our Ingeo® PLA and CPLA® has passed the following standards with regard to compostability:
  - ASTM D6400 (USA)
  - BPI (USA)
  - EN 13432 (EU)
  - GreenPla (Japan)
- GreenGood® Sugarcane products are made from natural Sugarcane Bagasse fiber and have passed the following standards with regard to compostability:
  - ASTM D6400 (USA)
  - BPI (USA)
  - EN 13432 (EU)
  - GreenPla (Japan)

# Example 2 – Certificate holders

| Product description | Certificate holder | Certificate number | Bio-based content (%) | Scope | Certied since | Status | Certification Body |
|---|---|---|---|---|---|---|---|
| 2K-DC Lack Durapid | Dr. Demuth Derisol Lackfarben GmbH & Co. KG | DIC-00008 | 9 | Product | 2018-05-08 | Valid | DIN CERTCO GmbH |
| Bio-based products | Österreichische Vialit GmbH | DIC-00007 | 100 | Product | 2018-03-27 | Valid | DIN CERTCO GmbH |
| Biofibre®Silva | Biofibre GmbH | DIC-00009 | 97 | Product | 2018-06-11 | Valid | DIN CERTCO GmbH |
| BTI 43, BBI 50, BBII 100 and BBII 80 | Bio4Pack GmbH | DIC-00002 | 89 | Product family | 2017-02-20 | Valid | DIN CERTCO GmbH |
| CENTURY™ 1105, CENTURY™ 1107 | Kraton Chemical B.V. | VIN-00007 | 99 | Product family | 2017-11-08 | Valid | Vinçotte nv |
| Coconut Charcoal Briquettes | TOM Cococha GmbH & Co. KG | DIC-00005 | 100 | Product | 2017-11-24 | Valid | DIN CERTCO GmbH |
| Luminy PLA L, Luminy PLA D | Total Corbion PLA B.V. | DIC-00001 | 100 | Product family | 2016-11-29 | Valid | DIN CERTCO GmbH |
| M-PURE | Maes Dyeing and Finishing | DIC-00003 | 92 | Product | 2017-05-18 | Valid | DIN CERTCO GmbH |
| PLA Flower Sleeve | Decowraps Europe BV | DIC-00006 | 96 | Product | 2018-01-17 | Valid | DIN CERTCO GmbH |

For more information look at: http://www.biobasedcontent.eu/en/certificate-holders

**Further Information**

IEA Bioenergy Task42 Website

http://task42.ieabioenergy.com

IEA Bioenergy website

www.ieabioenergy.com