



Netherlands Institute
for Sustainable Packaging

FACT SHEET

Biodegradable packaging



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Introduction

The Netherlands Institute for Sustainable Packaging (KIDV) frequently receives questions from businesses about biodegradable packaging and about biobased plastic packaging. To answer these and other questions, KIDV has drawn up the “Biodegradable packaging” and “Biobased plastic packaging” fact sheets. Both documents are an update of the “Biodegradable plastic packaging” fact sheet from 2018.

This fact sheet concerns biodegradable packaging. You can download the fact sheet about biobased plastic packaging [here](#). Both fact sheets have been drawn up in collaboration with CE Delft.

What is this fact sheet about?

In this fact sheet, KIDV provides a general overview of the current state of affairs concerning biodegradable packaging. Further details and more in-depth information can be found in the reports that are referenced in this fact sheet.

Since plastic is a commonly used packaging material, biodegradable packaging often takes the form of plastic packaging (e.g. PLA and starch plastics). However, biodegradable packaging can also be made of paper, cardboard or wood.

The following topics are discussed: the definition, degradability, certifications and labels for biodegradable materials and how these materials are processed during the waste phase. KIDV also offers businesses guidelines in the form of concrete suggestions and considerations regarding the application of biodegradable packaging, based on the national government's current policies and current recycling practices. This fact sheet will be updated if and when new waste processing techniques, new materials or new policies are introduced.

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For whom was this fact sheet created?

This fact sheet was written for the producers and importers of packaged products, their suppliers and consultants.

Clarification

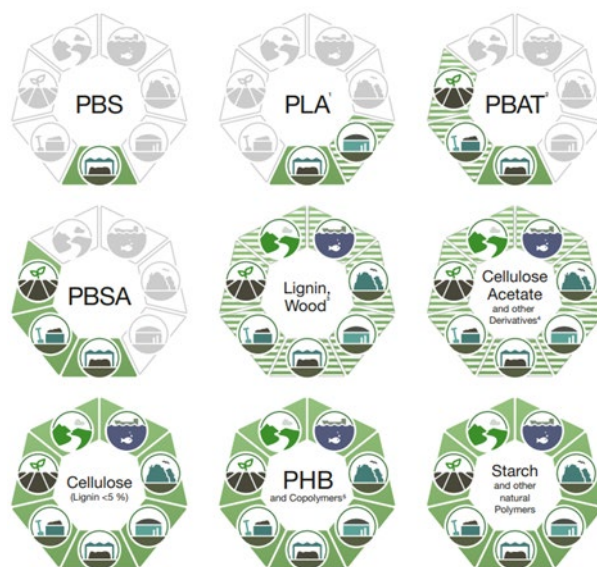
What are biodegradable materials?

The term “biodegradable” means that materials can be broken down into water (H₂O), carbon dioxide (CO₂), biomass and minerals salts. Under certain conditions, these materials can be broken down in nature (on land or in water), although the majority of biodegradable materials are collected as part of the household waste stream and - partly - the industrial waste stream and end up at waste processing facilities, where they are turned into compost in special plants.

Degradability

The rate at which a biological material breaks down depends on various factors, such as its chemical structure (in the case of plastics), the final product (in this case the packaging), the temperature, the amount of time spent in the composting plant, the microbial activity and the humidity. The environment is another important factor: the processes that occur in the soil differ from those that take place in water or in a composting plant. This is especially true for compostable products that are specifically designed to be broken down in nature or to assess the environmental impact in the event of a leak. Specific standards have been developed for biodegradability in the soil and in a maritime environment.

The nova-Institute¹ has created an overview of biodegradable plastics in various conditions. You can download this overview [here](#). Note that this overview concerns the materials, not the packaging as a whole.



1 OVERVIEW OF BIODEGRADABLE PLASTICS (NOVA-INSTITUTE)

¹ nova-Institute, 2021

The degradability of the base material alone does not provide sufficient information about the degradability of the packaging as a whole. To properly assess the latter, the final packaging must therefore also be tested. That means the base material including all seal layers, barriers and other additions. Businesses should know exactly what their packaging consists of.

Certifications for biodegradability

There are various certifications and labels that are used to indicate the degree of biodegradability of a packaging².

The OK Compost certification and the seedling logo indicate that packaging meets the requirements of the European standard for compostable packaging (EN-13432).



2 THE OK COMPOST CERTIFICATION (LEFT) AND THE SEEDLING LOGO (RIGHT)

The OK Compost HOME certification indicates that packaging can be broken down entirely on people's private compost heap at home.



3 THE OK COMPOST HOME CERTIFICATION

The OK Biodegradable certification indicates that a material is biodegradable in nature. There are three variants of the OK Biodegradable symbol:

² TÜV Austria, 2021

- OK Biodegradable MARINE: This label guarantees that packaging is fully biodegradable in natural salt water.
- OK Biodegradable SOIL: This label guarantees that packaging is fully biodegradable in the soil.
- OK Biodegradable WATER: This label guarantees that packaging is fully biodegradable in a natural fresh-water environment.



Click [here](#) for an overview of the standards used for each of these certification labels.

Processing biodegradable materials in the waste phase

A material's degree of biodegradability depends on various factors and conditions. Biodegradable and compostable materials - particularly plastics - are primarily designed to be processed under specific conditions.

There are various methods with which to process these materials during the waste phase:

Industrial composting

Compostable materials are broken down for a specific period of time and with a controlled process. This is done in the presence of oxygen. The materials are broken down into water (H₂O), carbon dioxide (CO₂), biomass and mineral salts. The EN 13432 standard applies to the industrial compostability of packaging. According to this standard, packaging is suitable for industrial composting if it meets requirements pertaining to the following four points³:

- Disintegration: within twelve weeks, at least ninety percent of the product must be broken down into particles smaller than two millimetres in size.
- Biodegradation: within six months, the product must be broken down biologically into inorganic substances (CO₂ and minerals).
- The maximum concentrations of heavy metals (Pb, Cr, Cd) must not be exceeded.
- Ecotoxicity: the product must not have a harmful impact on (the quality of) the compost.

³ Ovam, 2015

Disposing of biodegradable packaging as organic waste: yes or no?

At the moment, biodegradable packaging cannot be disposed of as organic waste, even if it is suitable for industrial composting in accordance with the EN 13432 standard. The only exception is made for special compostable organic waste bags, because these stimulate consumers to collect and dispose of their organic waste separately. In collaboration with NVRD, the Dutch Waste Management Association (Vereniging Afvalbedrijven) and Milieu Centraal, Rijkswaterstaat has drawn up the so-called [Yes/No list for organic waste](#)⁴ (only available in Dutch).

The Ministry of Infrastructure and Water Management, which is responsible for waste management in the Netherlands, signed a Green Deal with the coffee and tea sector in 2021. In this Green Deal, it was agreed that if eighty percent of all coffee pods and tea bags are made of compostable materials, these products can be disposed of as organic waste. This has been the case since 10 January 2023. See also: [Coffee pods and tea bags now also in organic waste \(January 2023; only available in Dutch\)](#).

Read more:

- National Waste Management Plan ([LAP3](#)). The National Waste Management Plan outlines the Netherlands' national policy for waste prevention and management. At the moment, the third iteration of this plan (LAP3) is in effect.
- [Letter to Parliament](#) about the policy for biobased and biodegradable plastics (June 2021, only available in Dutch).

International

Every country has its own regulations regarding the disposal of packaging as organic waste. In Germany and Belgium, for example, packaging cannot be disposed of as organic waste. In Southern European countries, certain products have to be compostable so they can be disposed of as organic waste. See here for a number of practical examples (not available in English):

Germany: [Alles Wichtige zum Thema Bioabfallsammlung](#)

Belgium: [Kom meer te weten over je afval](#)

Italy: [La raccolta differenziata e il riciclo organico](#)

Home compostability

The conditions in someone's private compost heap at home differ from those in an industrial composting environment. Composting at home is a slower and more difficult process (TUV Austria, 2021). Although there is no specific standard for home compostability, TUV Austria does issue the OK HOME compost certification to products that meet a combination of standards. More information can be found [here](#)⁵.

⁴ Rijkswaterstaat, 2021

⁵ TUV Austria, 2021

Biodegradation

Besides in an industrial composting plant or a private compost heap at home, biodegradable materials can also break down in the soil or in water. Examples of such materials are cellulose, starch and PHB⁶. However, it depends on the final structure and composition of a packaging whether these materials actually meet the biodegradability requirements.

Soil

Degradation in soil is particularly relevant for films that are used in the agricultural sector and which are mixed with the soil during a process called *mulching*. During *mulching*, the soil is covered with plastic film to reduce evaporation and maintain the humidity of the soil. Films that are suitable for this purpose meet the requirements of the ISO 17556 standard for plastics (for determining the ultimate aerobic biodegradability of plastic materials in soil). The OK biodegradable SOIL label is used for products that meet these requirements.

Sea water

This concerns biodegradability in salt water. The relevant standards are: ISO 19679 and ISO 22404 for biodegradation in a marine environment. The OK Biodegradable MARINE label is used for products that comply with these standards.

Freshwater

The OK Biodegradable WATER label is used for biodegradability in a freshwater environment. At the moment, there is no specific standard for this (yet).

More information about the degradability of polymers can be found in this [overview](#) created by the nova-Institute⁷. Examples of materials and packaging can be found in the [Biobased Packaging Catalogue](#) (only available in Dutch) created by Wageningen University & Research⁸.

⁶ nova-Institute, 2021

⁷ nova-Institute, 2021

⁸ Molenveld & van den Oever, 2014

KIDV recommendations for businesses

KIDV has created a list of points of attention for businesses that (want to) use biodegradable materials in their packaging.

Packaging for coffee and tea

If you put tea bags or coffee pods on the market, make sure these are compostable and meet the requirements of the Green Deal "Coffee pods and tea bags as organic waste." This Green Deal was signed by coffee and tea manufacturers, the Ministry of Infrastructure and Water Management and the Dutch Waste Management Association.

Since 10 January 2023, the Yes/No list for organic waste has been updated and from then on coffee pods and tea bags can officially be disposed of as organic waste⁹.

Packaging waste events and fast food

In situations where waste streams can be collected in a controlled manner, e.g. during festivals and concerts, as well as packaging waste from fast food restaurants, tailor-made solutions can be used to facilitate the effective processing of compostable plastic and paper products. The waste stream often consists of a mixture of trays, plates, cutlery, beverage cups and food. Beverage cups, for example, can be sorted during or after the festival/concert and then recycled. The stream that is left can be composted if trays, plates, etcetera of the right material were selected in advance and if clear agreements have been made with the waste processor about the collection, sorting and recycling of the waste. What the optimal choices are depends on the type of event (large or small, indoor or outdoor, one-day or multi-day event, etcetera).

Packaging in litter

Packaging is not designed to end up in the natural environment. This is also true for biodegradable plastic packaging. The current generation of biodegradable packaging does not break down fast enough in nature, which means all negative effects - e.g. visibility and inclusion in the food chain - still apply for this category.

⁹ VANG HHA, 2023

Communicate about the proper disposal method on the packaging

You can use the [Disposal Guide](#) to inform consumers about how and where to dispose of a packaging. Consumer studies show that logos with a disposal instruction are most effective for consumers¹⁰. The Disposal Guide's logos are available from KIDV; send an email to weggooiwijzer@kidv.nl.

KIDV has drawn up the [fact sheet Environmental claims](#) about the communication of environmental claims, e.g. about the origin of a material or its degradability. This fact sheet contains information about the relevant legal provisions, along with examples of what is (not) allowed.

On 30 November 2022, the European Commission published a Communication on an EU policy framework for biobased, biodegradable and compostable plastics. This Communication provides more clarity on the definitions of biobased, biodegradable and compostable plastics. It also sets out conditions to ensure that the environmental impact of their production and consumption is positive. This Communication is not legally binding, but is intended to provide insight and guidance for policy, purchasing, or investment decisions.¹¹

A product labelled as 'biodegradable' or 'compostable' must meet the following conditions:

- For 'biodegradable' products, it must be made clear to consumers that they should be disposed of in the proper waste stream. It should also specify how long the product takes to biodegrade, under what conditions and in what environment (such as soil, water, etc.). Products likely to become litter, including those covered by the single-use plastics (SUP) directive, cannot be labelled as biodegradable.
- Only industrially compostable plastics which comply with the relevant standards should be labelled as 'compostable'. Industrially compostable packaging should display the way in which the items should be disposed of. In home composting, it is harder to reach full biodegradation of compostable plastics. Home composting for plastics not covered by EU rules is only to be considered in the context of specific local circumstances, under the supervision of authorities and provided that the use of such plastics has a clear added value.

¹⁰ GfK, 2019

¹¹ https://ec.europa.eu/commission/presscorner/detail/en/qanda_22_7158

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