

Plastic: biobased or biodegradable?

A guide to the bioplastics market

The market for bioplastics is growing. From meat trays, disposable cups and cutlery to magazine wrappers, a growing number of products are now made from bioplastics. The Dutch Waste Management Association (DWMA) welcomes the trend towards more sustainable packaging, but notes that not all bioplastics contribute to the circular economy. The waste sector is in discussion with manufacturers and policymakers to determine how bioplastics can best be used to create added value in a sustainable society.

Based on **practical experience** and **new research**, the waste industry comes to the following conclusions:

- *Biobased plastic* packaging is easily recycled.
- *Biodegradable plastic* packaging currently delivers no added value because it cannot be composted or recycled.
- *Biodegradable plastics* are only a better option when used to make bags for collecting food waste or when they can be separately collected at end of life as monostreams (a single category of waste).

NB. See page 2 for the difference between biobased and biodegradable plastics.

The waste sector's **advice: mechanical recycling** and no composting

On bioplastics in consumer packaging, the DWMA recommends using biobased plastic with mechanical recycling and advises against composting. Composting biodegradable plastics is suitable only in specific cases, but not for consumer packaging.

This advice is based on current practice in which composting bioplastics delivers no added value. The government has also concluded that composting bioplastics has no added value within the circular economy.

This advice may change in future if new products and techniques come onto the market. The waste sector is always open to innovations and maintains a dialogue with policymakers, manufacturers and research institutes.





What are bioplastics?

The term 'bioplastic' refers to two broad groups of plastics: biobased plastics and biodegradable plastics.



BIOBASED PLASTICS

These are made from renewable natural raw materials, such as maize, sugarcane and sugar beet. The polymers cannot be broken down by bacteria or fungi.

Examples: bio-PET (polyethylene terephthalate) and bio-PE (polyethylene).

Biobased plastics can be mechanically recycled. They are currently used in:

- flexible and rigid packaging
- textiles
- consumer goods
- the car industry



Coca-Cola's Plant PET bottle

BIODEGRADABLE PLASTICS

These are mostly made from natural raw materials, such as maize, sugarcane and sugar beet, and can be broken down by fungi and bacteria. Biodegradable plastics that meet the European EN 13432 standard can be identified by the Seedling or OK Compost logo. This standard requires, among other things, that when treated in an industrial composting facility at least 90% of the material must be broken down within a period of 12 weeks.

Examples: PLA (polylactic acid), PHAs (polyhydroxyalkanoates) and starch plastics.

Biodegradable plastics are currently used in:

- films, such as magazine wrappers
- bottles, dishes and trays
- textiles
- consumer goods, including plant pots and tablecloths
- agriculture and horticulture, including agricultural film
- food waste bin liners



Food waste bin liners



Which bin should bioplastics go in?



BIOBASED PLASTICS: IN THE PLASTIC OR PMD BIN

Biobased plastics such as bio-PET and bio-PE are easy to recycle using current waste treatment technologies. Fossil and biobased plastics contain the same polymers. Bio-PET is therefore equivalent to PET and bio-PE is equivalent to PE. These plastics are removed from the plastic mix by infrared sorters and can then be recycled for use in new products – without any loss of quality or additional cost.



BIODEGRADABLE PLASTICS: NOT WITH THE FOOD AND GARDEN WASTE!

Labels, wrappers, supermarkets and the Seedling logo all suggest that biodegradable packaging can be put in the food and garden waste bin, but the waste sector advises against this. Most biodegradable packaging collected with food and garden waste leaves the composting facility in the residual waste stream. It is sent to a waste-to-energy plant, where it joins the residual household waste stream for incineration with energy recovery. The reason why so little biodegradable plastic is composted is that the composting periods used at Dutch composting facilities are shorter than is needed to break down many of the biodegradable plastics. Composting these plastics also has little or no added value: biodegradable packaging breaks down to carbon and water and so it does not increase the amount or quality of the compost.



BIODEGRADABLE PLASTICS: NOT IN THE PLASTIC OR PMD BIN!

Biodegradable plastics should also not go in the plastic or PMD (plastic, metal and drink packaging) bin. This is because it disrupts the plastic recycling process. In the recycling of the hard plastics PP and PE, biodegradable plastics end up in the residual waste and are incinerated with energy recovery. In the recycling of PET plastics, some of the biodegradable plastic finds its way into the recycling product, but with adverse effects on quality, such as discoloration.

Confusing to consumers

Is it green waste, plastic waste, or even residual waste? Saying that biodegradable plastics are compostable, while biobased plastics belong in the plastic or PMD bin, blurs the separate collection message. Consumers may become confused and as a result be less motivated to separate their waste. It can also lead to greater levels of contaminants in separated waste streams.



When to use biodegradable plastics: separately collected monostreams and food waste bin liners

Most biodegradable plastics now on the market have no added value for a sustainable society. They are not composted and not recycled, but eventually incinerated in waste-to-energy plants along with residual household waste. Making biodegradable plastics therefore has little value because the environment, the climate and the soil do not benefit.

But there is a niche market for biodegradable plastics. In some cases biodegradability is beneficial and only in these cases does the use of biodegradable plastics have added value.

Examples:

Monostreams (a single specific waste category), such as manufacturing waste from factories and plastic beakers used at festivals: These can be collected separately and processed in a particular way in composting facilities. The possibilities depend on the individual composter and waste collector.

Food waste bin liners for use in the kitchen: These biodegradable bags improve the ease and efficiency of food waste collection and so help to increase the total volume of separately collected food and garden waste. The bin liners are such a success that the composting sector wants to keep them.



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