

Plastics|SA's view on Degradable, Biodegradable and Oxo-Biodegradable Plastics

As the use and publicity of degradable plastics increases, so does the confusion surrounding the environmental claims put forward. The general perception is that degradable plastics will dissolve and disappear over time versus conventional plastics that will be around forever. It is not that simple.

Plastics|SA has created this position paper with the intention of better informing the public, media and packaging decision makers.

As a result of insufficient or incorrect information, consumers often base their decisions on foreign, poorly researched or emotional articles. Each country needs to find its own unique solutions to litter, municipal solid waste and poor human behaviour.

Position

- Plastics|SA welcomes and supports any innovations that enable plastic products to meet the required high quality performance standards.
- Plastics|SA recommends that any product environmental impact should be measured against comprehensive Life Cycle Assessments together with costs evaluations. As such, it is not correct to assume that oxo-biodegradable or bio-based plastics have by definition a lower environmental impact.
- It is crucial that any environmental claims are backed by sound science and standards. All environmental claims such as biodegradability, compostability or the bio-based content are in compliance with appropriate standards such as ISO 14021.
- It must be emphasised that market requirements will remain a determining factor in choosing the plastic grade with the desired property profile. The choice is therefore directly related to the functionality and not to the raw material base of the plastic which can be either fossil or bio-based.
- Biodegradable plastics are not a solution for littering. Plastics recycling are an integral part of South Africa's economy. Over the past few years South Africa has recycled more than 100 000 tons of plastic bags, wrapping and film every year.
- Plastics|SA seeks to build confidence in the technical integrity of recycled material that is able to demonstrate its ability to perform as a viable alternative to virgin plastics. If a proportion of recycled plastic contains oxo-biodegradable material, it could change the characteristics of the material and may lead to a failure of products as degradation

occurs, resulting in the hindering of market acceptance which will lead to reduced value of recycled material in South Africa.

Influence on Environment

It is important to understand that bio-based plastics are not always biodegradable and that biodegradable plastics are not always bio-based. It is possible to make biodegradable polymers from fossil raw materials. It is essential to make this distinction in order to avoid confusion when addressing different societal and environmental concerns of bioplastics. It is also essential that those who use the additives consider the sustainability implications of these additives on the recyclability of plastics.

Definitions

Many stakeholders use the general term “bioplastics” to describe different concepts, often leading to confusion. Biodegradability and compostability as material properties are regulated by international standards.

We distinguish between the following:

- **Biodegradable plastics** are degradable due to the action of micro-organisms and enzymes. The aerobic or anaerobic decay of biodegradable plastics by micro-organisms is the conversion of the organic matter into carbon dioxide (or methane); mineral salts and water under specific environmental conditions, either through processes in nature or man-made (degradation in industrial composting plants, anaerobic digestion plants, etc.).
- **Compostable plastics** are degradable due to a biological process occurring during composting and are converted into carbon dioxide, water, mineral salts and biomass. There are no toxic side effects like toxic residue for water, soil, plants or living organisms. Note that not all biodegradable materials meet compostable criteria. Materials which do not fulfil these criteria may still be biodegradable under specific environmental conditions. To ensure that waste treatment facilities work properly, only plastic waste which is compliant with the standards and requirements of the respective facility enters composting streams.
- **Bio-based plastics** are plastics derived entirely or partially from renewable resources, such as vegetable fats and oils, corn or starch. Fossil-fuel plastics are derived from petroleum. The use of renewable resources as feedstock in the production of bio-based materials is seen as a way of reducing the dependency on oil. Bio-based plastics made from renewable resources can be used in a variety of applications and complement currently used fossil based products. Bio-based plastics can offer similar, additional or even better functionality depending on its composition.

- **Oxo-degradable plastics** degrade when exposed to heat and/or light. The additives serve to initiate and accelerate break-down of the plastic by a process known as 'oxidative degradation'. Exposure to heat and/or light causes the molecules to break apart so that the plastic weakens in strength, becomes brittle and fragments into small pieces. The time taken for the plastic to start to degrade will depend on the amount of additive in the plastic and the type of environmental conditions it is exposed to. Therefore, it is not possible to accurately predict when the plastic will start to degrade.

Conclusion

Plastic recycling is an integral part of South Africa's economy. Last year 264 758 tons of plastic was collected and recycle.

year. Recycled plastic waste is used to make many new long-term plastic products such as bags refuse bags, agricultural- and building products such as water pipes, builder's film, fencing and decking.

One of the challenges faced by the plastics recycling sector over the past decade has been that of building confidence in recycled material and demonstrating its ability to perform as a viable alternative to virgin plastics.

The real concern is the impact of a degradable additive once the plastic is recycled and used in second and successive applications. A large quantity of recycled plastics goes into carpeting, geo-textiles, strapping, plastic timber and pipe. The concern is what will happen when the polymer molecules break down during the expected service life – failure and potentially expensive remediation.

A final concern about degradable, biodegradable and oxo-biodegradable packaging is that the product is composed of non-renewable fossil fuel based inputs and there is little difference in regards to energy and resource usage when compared to conventional disposable packaging. If biodegradable and oxo-biodegradable packaging are meant to break down in a landfill environment, the products will not be recovered through waste management and recycling initiatives, resulting in a loss of resources (the calorific value of plastics) in the same way these resources are lost if they are not recycled.

Solutions to litter and irresponsible consumer behaviour should be sought and South Africans should be encouraged to embrace the strong and viable recycling industry by designing plastic products and packaging with recycling in mind. This will continue to provide jobs and keep our natural resources in circulation.

Plastics SA is committed to a policy of achieving zero plastic to landfill as determined by the Waste Management Act. In line with this objective, Plastics SA therefore recommends that no oxo-biodegradable products be used as these would contaminate the recycling waste stream, thereby reducing the value and recycling rates of plastic. If, however, further scientific evidence shows that there are other benefits to the use of oxo-biodegradable products, Plastics|SA will reconsider its position.

Plastics | SA

Plastics|SA represents the plastics industry of South Africa. Its members represent all sectors of the SA Plastics Industry including polymer producers and importers, converters, machine suppliers and recyclers. The plastics chain in South Africa employs over 60 000 people, and is defined as a priority sector by Government. The combined turnover of the industry is some R 50 billion per annum and consumption is approx. 1,370 million tons per annum.

Plastics|SA operates from three centres: the Head Office in Midrand, Gauteng and the two regional centres located in Pinetown KZN and in Cape Town. Plastics|SA provides industry training and drives the plastics industry Environmental initiative.

For more information visit: www.plasticsinfo.co.za