Biodegradable Plastics Association

A not-for-profit Association

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SUSTAINABLE PACKAGING COALITION POSITION STATEMENT

RESPONSE BY THE BPA

It has come to our attention that in February 2023 an organisation called the "Sustainable Packaging Coalition" (SPC) had issued a position statement on "DEGRADABILITY ADDITIVES IN PETROLEUM-BASED PLASTICS"

Having read this statement we think, for the following reasons, that it is an irresponsible document, and should be withdrawn.

The SPC must be well aware that plastic packaging is a significant component of the millions of tons of plastic litter which get into the open environment, and especially the oceans, every year. They are interested in "Reduce, Re-use and Recycle" but they offer no constructive policies for dealing with litter which can not realistically be collected from the open environment for recycling or anything else.

They are aware that a technology has been invented for dealing with this problem, but far from encouraging its use by the packaging industry, they are trying to persuade them against it. Their rationale is given in their statement as follows, but it is muddled and misleading. They have made no attempt to engage with the BPA to clarify their understanding.

1. Additives Have a Negative Impact on Recyclability
Plastics have two inherent attributes that make them ideal for recovery: their high embodied energy content qualifies their value for controlled energy recovery.

This is correct, but it has nothing to do with recyclability.

… their exceptional durability renders them ideal for recycling. Additives that are fundamentally designed to compromise the structural integrity of a recyclable material are counterproductive to efforts to recycle more materials and to extract as much future value as possible from existing materials.

This shows a failure to understand oxo-biodegradable technology. Oxo-biodegradable plastic is plastic which can be made in the same way and with the same materials as ordinary plastic. It is designed to have a service life appropriate to the particular product, during which it can be re-used and recycled, and during that time it is, like ordinary plastic, inaccessible to bacteria, so biodegradation cannot occur. The statement that it has a negative

impact on recyclability is simplistic, for the reasons given in detail at https://www.biodeg.org/subjects-of-interest/recycling-2/

Additives Contribute to Microplastics on Land and in Water

Most additives are designed to break plastics down into smaller pieces in order to make it sufficiently available to the microorganisms that perform biodegradation. These fragmented pieces may be invisible to the naked eye, yet their effects as microplastics have been shown to be seriously detrimental.

The additives are not designed to break plastics down into smaller pieces. They are designed to reduce their molecular weight by oxidation and thereby to convert the plastic into a biodegradable material. It is not the *size* that matters, but the molecular weight.

If ordinary plastic is discarded into the open environment, it will rapidly become brittle and will create microplastics. These will not be biodegradable, because their molecular weight is too high, and they will therefore lie or float around for decades. However, if the plastic had been upgraded at manufacture with oxo-biodegradable technology, it would oxidise much more rapidly and would become accessible to bacteria. At that point biodegradation will commence, and the material would be removed from the environment by the naturally-occurring bacteria.

Terrestrial litter is likely to migrate, either by human or natural means, into a marine environment. Additives that are designed to enable biodegradation in terrestrial (on-land) conditions are not tested or designed to be effective in marine conditions. This is because marine conditions have a wider variability in temperature, microbial and nutrient availability, and exposure to sunlight.

This is not correct. Before making statements of this kind the SPC should have read and understood the report of the Oxomar project https://www.biodeg.org/wp-content/uploads/2021/07/Final-report-OXOMAR-10032021.pdf This was a four-year study into oxo-biodegradable plastic sponsored by the French government, which concluded that: "We have obtained congruent results from our multidisciplinary approach that clearly shows that biodegradable plastics biodegrade in seawater and do so with a significantly higher efficiency than conventional plastics. The oxidation level obtained due to the d2w prodegradant catalyst was found to be of crucial importance in the degradation process."

In a marine environment, any fragmentation of petroleum-based plastic will exacerbate its harmfulness as pollution. Whether or not biodegradation successfully occurs in these various environments and conditions, petroleum-based plastics should not be designed to encourage fragmentation.

This is not correct either. As mentioned above, the harmful fragments are created by the embrittlement of ordinary plastics when exposed weathering. They will float around in the ocean for very many years until they become biodegradable, and during that time toxins will be attracted to their surface, and will then find their way into the tissues of marine creatures who ingest the fragments. However, if the plastic is oxo-biodegradable, its dwell-time in the ocean would be very much shorter. It would therefore be less likely to be ingested by marine creatures and less likely to attract toxins.

3. Additives are not an Enabler for Compostability
Compostability describes a material's ability to successfully undergo biological decomposition and transformation into a stabilized organic matter within a specified period of time. To beneficially complete the natural biological cycle, biodegradation should occur in a managed and controlled environment, such as an industrial composting operation. The material must also break down in a way that is non-toxic and harmless to human health and the environment.

This is a correct statement in relation to kitchen and garden waste which is sent for composting and converts into compost, which is a valuable soil-improver. However, this has nothing to do with plastics. Even the type of plastic marketed as "compostable" does not convert into compost – this is because ASTM D6400 and EN13432 require it to convert into CO2 gas within 180 days.

Petroleum-based plastics made with biodegradability additives do not break down in such a manner. To date, these additives have not enabled non-compostable plastics to become compostable.

This is not correct. Oxo-biodegradable plastic has been proved according to ISO 14855 to biodegrade in a composting facility as to 88.9% in 121 days, but oxo-biodegradable plastic is not marketed for composting. For the reasons explained at https://www.biodeg.org/subjects-of-interest/composting/ the BPA does not consider that plastic of any kind has a useful role in the composting process.

Landfills - The SPC does not support the use of any kind of degradability additives in packaging, including additives that seek to make packaging more degradable (i.e. break down more rapidly) in landfills.

Abiotic degradation of oxo-biodegradable plastic cannot occur in anaerobic conditions. It is not intended to break down more rapidly in landfills, because if a piece of plastic has been taken to landfill it has been responsibly disposed of and there is no need for degradation. Oxo-biodegradable technology is intended to deal with the millions of tons of plastic litter which get into the open environment, and especially the oceans, every year, and which do not get collected for recycling, for landfill, or for anything else.