



OXO-BIODEGRADABLE PLASTICS ASSOCIATION

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CALIFORNIA SB 270 on SHOPPING BAGS

Lightweight plastic bags are still the most inexpensive, convenient, and cost-effective way to take our groceries home and to protect them from contamination. A Life-cycle Assessment written by Intertek in 2011¹ put the environmental credentials of lightweight plastic shopping bags ahead of paper, jute, cotton, or compostable plastic. Oil-based plastics do not cause resource-depletion, since they are made from a by-product of oil which used to be wasted. The oil is extracted to make fuels, and the same amount would be extracted even if oil-based plastics did not exist.

This Bill seeks to deprive consumers of the benefits of lightweight plastic shopping bags², and this would impact hardest on large families on low-incomes.

The justification for the ban is that lightweight plastic shopping bags are often discarded into the outdoor environment where they lie or float around for decades, causing visual pollution and harming wildlife. This is a fact, though the contribution made by shopping bags (as distinct from packaging, fishing tackle, bottles, and other plastic products) is exaggerated.

In order to meet this challenge oxo-biodegradable plastic technology was invented and developed by distinguished polymer scientists in Britain, France, Sweden, Italy, Brazil and the USA. It causes plastic to convert at the end of its useful life into biodegradable materials, which biodegrade in the outdoor environment in the same way as a leaf. Light and elevated temperatures are NOT necessary for the conversion process, but they will accelerate it. Nor is moisture necessary. This technology is NOT the same as “compostable” plastics.

There is little or no additional cost for oxo-biodegradable plastic, as it can be made with the same machinery and workforce and with the same raw-materials as conventional plastic. The technology has been available in the USA for more than ten years, but the California legislature seems not to have been properly informed about it. Instead of banning lightweight plastic bags they should require them to be made with oxo-biodegradable technology.

The technology is already in use by innovative companies in the US plastics industry, but lawmakers in California (and indeed the whole of the USA) are lagging behind countries in Africa, Asia, and the Middle-East who have already made it mandatory.

Oxo-biodegradation is officially defined by CEN³ as “degradation resulting from oxidative and cell-mediated phenomena, either simultaneously or successively.” It has been studied by scientists for many years, most recently at the Technical Research Institute of Sweden and the Swedish University of Agricultural Sciences, and a peer-reviewed report of the work was published in Vol 96 of the journal of Polymer Degradation & Stability (2011) at page 919-928. They found 91% biodegradation within 24 months.

Oxo-bio plastic has the same strength and appearance as ordinary plastic, and there is little or no extra cost, as there is no need to change machinery at the factory. The plastic

¹ [http://www.biodeg.org/files/uploaded/biodeg/Carrier_Bags_Report%20EA%2018-02-11\(5\).pdf](http://www.biodeg.org/files/uploaded/biodeg/Carrier_Bags_Report%20EA%2018-02-11(5).pdf)

² See below as to “compostable” plastic bags

³ The European Standards Authority

does NOT just fragment into small pieces. When it has become biodegradable it is no longer a plastic, and it has to pass the tests in BS8472 or ASTM D6954 to prove that it is biodegradable and non-toxic and that it does not contain heavy metals. It does not therefore create microplastics.

If oxo-bio plastic merely fragmented without biodegrading, the American and British Standards authorities would not have included tests for biodegradability in ASTM D6954 and BS8472.

The abiotic phase of oxo-biodegradation can be as short as a few months after discard, and as the residues are invisible at the end of that phase and are completely harmless, as proved by OECD eco-toxicity tests, it is not important (except in some special applications) how long they take for total biodegradation. They do NOT include heavy metals. The material has also become polar - so it will stick to the earth and will be much less likely to blow around as dust than would fragments of conventional plastic. Materials such as twigs and straw, which are obviously biodegradable, will usually take much longer than oxo-biodegradable plastic to completely bio-degrade.

The Bill exempts “compostable” plastic bags from the ban, but as the justification for the Bill is shopping bag litter, the legislature has chosen the wrong type of biodegradable plastic. “Compostable” plastics are tested by ASTM D6400 to biodegrade in the special conditions found in an industrial composting unit, not in the outdoor environment. This may be useful for special bags for collecting food waste as part of a dedicated collection scheme, but not for shopping bags.⁴ In fact it would be misleading to market these bags as compostable because they cannot be made into compost. D6400 requires them to convert rapidly to CO₂ gas – not to compost.

Oxo-biodegradable plastic CAN (and “compostable” plastic cannot) be recycled⁵ if collected during the useful life of the product, without the need for separation, but if separation were required the oxo-biodegradable plastics industry could easily include an inexpensive marker.

The plastic particles which have been found in the ocean are fragments of conventional plastics, and the problems which they cause would be much reduced if they were oxo-biodegradable.⁶

Indeed, if all the plastic had been oxo-biodegradable there would be no ocean garbage patches.

⁴ <http://www.biodeg.org/files/uploaded/biodeg/EU%20Plastics%20industry%20advises%20against%20bio-based%20plastic.pdf>

⁵ <http://www.biodeg.org/files/uploaded/ROEDIGER%20REPORT%2021%20May%202012.pdf>

⁶ <http://www.biodeg.org/files/uploaded/biodeg/Micro-plastics%20in%20the%20marine%20environment.pdf>