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RESPONSE TO EUROPEAN BIOPLASTICS “FACT SHEET” ON BRITISH STANDARD 8472 FOR OXO-BIODEGRADATION OF PLASTICS

The first point to remember is that “European Bioplastics” is a lobby group for the rival bio-based section of the bioplastics industry. They are experts in hydro-biodegradable plastics, but they have no expertise in oxo-biodegradable plastics. Their lack of understanding of oxo-biodegradable plastics is apparent from several statements in their “fact sheet.”

For example, they say “the second test provides information on the biodegradation of the fragmented plastic particles obtained after the oxidation test.” However, an oxo-biodegradable plastic falls into fragments because the pro-degradant formulation in the additive has caused a change in the molecular structure, and the fragmented material is no longer a plastic. It has been converted into inherently biodegradable materials such as aldehydes and ketones, which will be bio-assimilated in the open environment in the same way as a leaf.

Their next point is that “the effect of both heat and light on plastic materials is to induce an oxidation,” but they are confusing oxo-biodegradable plastic with photo-degradable plastic. It is exposure to oxygen which induces oxidation in a plastic containing an oxo-biodegradable additive. The effects of heat and light are to accelerate the process, but they are not essential.

They criticise the Standard on the basis that it contains no “pass/fail” tests, but they are confusing BS 8472 with a Standard Specification, which they accept it is not. It is essential to understand the difference between a Standard and a Standard Specification.

The purpose of BS8472 (and American Standard D6954) is to provide standard tests by which oxo-biodegradable plastics can be tested. Oxo-biodegradation is defined by CEN in TR15351 as “degradation resulting from oxidative and cell-mediated phenomena, either simultaneously or successively.” These Standards prescribe tests which can be performed in a laboratory within a reasonable timescale and at reasonable cost in order to answer the questions 1. Is this plastic degradable? 2. If so, is the resulting material biodegradable? 3. Is it eco-toxic?

The question whether the sample of a plastic product has “passed” or “failed” the tests depends therefore upon the report required by para. 10 of BS8472. If the report shows that the material has degraded and biodegraded under the conditions reported, to a degree and within a timescale acceptable for the particular product to the customer (or to the government in countries with relevant legislation), and that it is not toxic, it has





passed – otherwise it has failed. “European Bioplastics” are therefore incorrect in saying that “it is not possible to make any claim regarding the performance of a plastic product with regard to this test.”

They have perhaps been confused by para. 0.3 of BS8472, which needs to be amended when this Standard is reviewed, to make it clear that although the mere fact that a material has been tested according to the Standard “does not provide any recommendation about the suitability of the tested products for any particular application” the report required by para. 10 does provide a basis on which an informed decision can be made as to the suitability of the product for a particular application in the real world.

Further, “European Bioplastics” do not appear to understand the essential difference between oxo-biodegradable and compostable plastics.

Compostable plastic is designed for aerobic composting in municipal or industrial waste treatment facilities, and it is therefore necessary to specify a timescale which industrial composters find acceptable for biodegradation in the special conditions found in industrial composting. That is why the composting standards such as EN13432 and ASTM D6400 have been written as Specifications. Paras. A.2.2.1 and A2.2.2 of EN13432 require 90% of the plastic to convert into CO₂ gas within 180 days, and para. 6.3 of ASTM D6400 requires 60% conversion in 180 days. This incidentally makes no sense in a world concerned about climate change caused by CO₂ emissions.

By contrast, oxo-biodegradable plastic is not designed to function within the parameters set by the above-mentioned composting standards, and can be used for many different applications, each with a different programmable service life – for example a bread-wraper with a service life of 6 months, or a plastic “bag for life” with a service life of five years.

Of course the correlation of degradation-time in the laboratory to degradation-time in the real world can only be approximate, and this applies to testing according to EN13432 and ASTM D6400 as it does to testing according to BS8472. Moreover, timescale for degradation in the real world is not as critical for oxo-biodegradable plastics as it is for compostable plastics. In the case of oxo-biodegradable plastics what really matters is that the plastic is converted into a biodegradable material much more quickly than an ordinary plastic under the same conditions - not that it is converted according to a precise timescale.

Oxo-biodegradable plastic is designed to biodegrade if it gets into the open environment, and to do so in the natural conditions found there. It is not possible to provide a timescale in a general standard for oxo-biodegradable plastic, because the conditions found in industrial composting are specific and the conditions found in the open environment are not. Moreover, the time taken for oxo-biodegradable plastic to commence and complete the process of degradation can be deliberately varied, which is not possible with compostable plastics.



There is therefore no pass/fail timescale in BS8472, although para. 8.2 does provide that at least 50% carbon evolution must be achieved. No doubt 50% would be achieved by any conventional plastic but the report would show that this would take decades, and has no relevance to the purposes for which BS8472 is designed.

Finally, European Bioplastics are confusing paras. 3(c) and (d) of Annex II to the European Parliament and Council Directive 94/62/EC of 20th December 1994 on packaging and packaging waste. Para. 3(c) is the requirement for packaging recoverable in the form of composting. Para. 3(d) is for Biodegradable packaging waste, which must be “of such a nature that it is capable of undergoing physical, chemical, thermal or biological decomposition such that most of the finished compost ultimately decomposes into carbon dioxide, biomass and water”. Oxo-biodegradable packaging can be shown by testing according to BS 8472 to comply with para. 3(d).

They make the obvious point that litter is not part of European waste policy, but it is nevertheless a fact of life. On 18th July 2008, the former Chairman of European Parliament’s Environment Committee, Dr. Caroline Jackson, issued a statement to the press in which she said: “we will never succeed in collecting all the waste and some may remain to disfigure the landscape. This is particularly the case with plastic waste. Where this goes uncollected it can accumulate in the environment, polluting the land and the oceans for many decades, and perhaps for hundreds of years. However, technologies have now become available which can produce plastic products which will harmlessly degrade at the end of their useful life.”

More recently, the EU commission have expressly recognised the problem of plastic litter in the environment, which d2w is designed to address. In their Consultation Document on Plastics Bags¹ the Commission said:

“Plastic carrier bags are packaging products with a short lifespan that due to their low weight and small size, can easily escape the waste management flows and be conveyed to the sea by rain, drains and rivers. Once in the environment, plastic bags can last for hundreds of years. Because they last so long, every year the number of plastic bags in the litter stream increases. “

The Commission also said “In the current practice, a packaging product is acknowledged to be biodegradable if it biodegrades in industrial composting facilities in controlled conditions. However, a product that is compostable in an industrial facility will not necessarily biodegrade in natural conditions in the environment.”

The Commission made the important point that “Advertising a packaging product as biodegradable when in fact it will not biodegrade in natural conditions can be misleading for the consumer and can contribute to the proliferation of littering of products that will persist in the environment.” It is therefore to be expected that suppliers of most types of compostable plastic will stop describing their product as “biodegradable.”

The Commission also said “The current legislative provisions do not allow for a clear distinction between biodegradability and compostability” - highlighting the need for a Standard for oxo-biodegradable plastic, which has now been published as BS8472.

¹ 17th May 2011 <http://ec.europa.eu/yourvoice/ipm/forms/dispatch?form=PLASTICBAGS>

