Submission to ACCC re OxoPak Pty Ltd-Certification Trade Mark Application Nos. 1852559 & 1852561-63

From Planet Ark Environmental Foundation (Planet Ark) and the Australian Packaging Covenant Organisation (APCO)

The Australian Competition and Consumer Commission (ACCC) is considering an application from OxoPak Pty Ltd to register four certification trade marks (CTMs). The marks bear the words:

- Food Fresh Food Safe Certified Solution
- Marine Life Safe Certified Solution
- PlanetOxoPositive – Certified Oxo-Biodegradable Plastic and
- 'Land Zero Waste Certified Solution'.

The marks, together with their application numbers, are illustrated below.

CTM 1852559

CTM 1852561

CTM 1852562

CTM 1852563

In response to your letter seeking advice relating to the application from OxoPak Pty Ltd to register these certification trademarks we advise the following:

Summary: The ACCC consultation letter invited Planet Ark and APCO to express a view as to **"whether consumers are likely to be *misled* by the CTMs"**. What follows is an introduction outlining the issues in the use of oxo-biodegradable plastics, and the need to be cautious about the inherent claims of the CTMs, from a comprehensive review[1]. Each CTM will be examined for the evidence supporting its claims, ending with a statement on the broader implications of these CTMs on the recycling and disposal of plastics in the overall waste stream in Australia, and the lack of support internationally for the use of oxo-biodegradable plastics.

Important issues and questions

The most important issues regarding oxo-degradable plastics are the ***extent*** to which they degrade or biodegrade over time, and the ***impact of this on the environment***.

There is published chemistry research evidence that oxo-degradables degrade when exposed to either sunlight or heat (~60°C). This degradation process causes deterioration in the strength of the plastic, which becomes brittle and easily fragments into small pieces. The time taken for fragmentation to occur will depend on the amount of additive in the plastic film and the environment to which it is exposed. For example, degradation reactions leading to fragmentation of polythene films will occur much more quickly in Queensland in summer compared with the Victoria in winter because of the differences in temperature and the intensity of the sunlight.

However, the key question is whether the *chemically* degraded oxo-degradable plastics *biodegrade* further (i.e. whether the plastic can be colonised and metabolised by microbes) and if so, what is the *extent and time frame of this process*. Biodegradation is caused by the action of living organisms rather than physical or chemical processes. The term 'biodegradable' does not specify the extent, time-scale or conditions under which biodegradation has taken place.

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[1] EV0422 Assessing the Environmental Impacts of Oxo-degradable Plastics Across Their Life Cycle. Loughborough University. A research report completed for the Department for Environment, Food and Rural Affairs. Published by the UK Department for Environment, Food and Rural Affairs in January 2010.

After the oxo-degradable plastics start to degrade it is unclear what happens to the small fragments of plastic in the environment.

- Are they able to be completely assimilated by micro-organisms (bacteria, fungi and/or algae) and ultimately converted to carbon dioxide and water vapour, so that they disappear?
- Does it matter if they remain as fragments in the soil?
- Does it matter if they become air-borne or enter water courses?

The overall conclusion of the comprehensive EV0422 review[1] is that **"incorporation of additives into petroleum- based plastics that cause those plastics to undergo accelerated degradation does not improve their environmental impact and potentially gives rise to certain negative effects."**

The key points relevant to all the CTMs under consideration are:

- The length of time for degradation of oxo-degradable plastic cannot be predicted accurately because it depends so much on the environmental conditions. The peer-reviewed evidence based on standard methods suggests that the biodegradation of oxo-degradable polyethylene is no more than 15% after 350 days[1].
- Labelling the oxo-degradable plastics as biodegradable can lead to confusion on the part of consumers, who may assume that biodegradable plastics are compostable. This may lead to contamination of the composting waste-stream with oxo-degradable plastics.
- The fate of plastic fragments that remain in the soil is an area of uncertainty, leading to a significant risk of bioaccumulation due to ingestion by living organisms.

OxoPak will use the CTMs to indicate that the approved product meets 'higher standards of degradability, biodegradability, and eco-toxicity than other products within the same product category'. Therefore, comparison with biodegradable bioplastics is recommended.

Additional comments relating to each CTM follow, drawing on findings in the EV0422 review[1] and other sources as cited:

CTM 1852559 Food Fresh Food Safe Certified Solution

Planet Ark and APCO do not have experience or expertise in the specific issues relating to food packaging and its implications for food safety. However we believe this CTM could be seen as misleading in implying that other products are not suitable for fresh food and by inference not safe. The standards listed are only for degradation, not for contact with food. No measurement on the safety testing for food packaging is included in the requirements. The CTM implies that some form of testing has taken place to say that it is safe to use with food. This is not a requirement of the rules.

CTM 1852561 Marine Life Safe Certified Solution

Oxo-biodegradable plastics with specific densities less than water are thought to float on the surface, exposed to UV light and heat from the Sun, and disintegrate to small fragments. The fate of oxo-degradable plastic in marine environments after it has fragmented to a fine powder is not clear. Further research is necessary to determine whether complete degradation to carbon dioxide and water is achieved, and if so, over what time scale. If the fine particles are found to persist in the marine environment for a long period of time, research should be carried out to determine the effect of the particles on marine organisms. There is also evidence that degraded fragments become cross-linked and hence persist in the marine environment[1, 6].

The Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment (ASTM D669109) requires that plastics must have converted at least 30% of their carbon content into carbon dioxide within six months[2]. Tests conducted proved that samples of oxo-degradable and standard polyethylene in the water received around 90% less UV light after 40 weeks in comparison to samples not immersed in water, reducing the oxidation process. After 40 weeks, only 2% of surface area of

[2] ASTM D669109 Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials in the Marine Environment

oxo-degradable and conventional plastics was lost, whereas compostable plastics degraded entirely under similar conditions[3].

Another study showed plastics with oxo-degradable additives did not biodegrade successfully in marine environments during the tests conducted[4]. Many additives designed to enable biodegradation in terrestrial conditions are not designed to be effective in marine conditions facing wider variability in temperature, microbial and nutrient availability, and exposure to sunlight in open oceans[5].

The actual level of the pro-degradants (transition metal compounds) in the plastic products will vary according to the anticipated environmental conditions and the required time for degradation of the product. This information is not disclosed by the additive producers, but from examination of the patent literature and discussion with stakeholders it is estimated to be between 0.01 and 0.5 weight %[1]. Given that the additives are used in very small amounts it could be argued that these additives do *not* have a negative environmental impact. However, very little peer-reviewed published work has been done to assess the toxicity of the oxo-degradable additives to plant, soil and freshwater or marine organisms[1].

CTM 1852562 PlanetOxoPositive – Certified Oxo-Biodegradable Plastic

Planet Ark and APCO believe this CTM is particularly problematic because of its vagueness. It gives a green impression without being specific and appears to contravene a number of the ACCC's Green Marketing Guidelines. A positive environmental impact requires some form of environmental benefit.

The circled arrows in the trade mark may mislead consumers that oxo-biodegradable plastics can be recycled. We believe it is unreasonable to claim that oxo-degradable plastics are recyclable in existing recycling streams because the oxo-degradables in the recycling stream will have an adverse effect on the quality and usability of the product. It is quite clear that the product will be more prone to degradation, which will be particularly damaging for long-life applications such as membranes used in construction, and medium-life applications, such as garden furniture.

An area of uncertainty is the fate of plastic fragments that remain in the soil. These are regarded as beneficial by the producers because they are claimed to add to the content of humus in the soil. However, there is a lack of evidence about the environmental impact of oxo-degradable plastic fragments in the soil and a number of concerns have been raised. For example, these fragments might act to concentrate pesticide residues in the soil[6].

Given the lack of biodegradability evidence one cannot claim a positive impact.

CTM 1852563 'Land Zero Waste Certified Solution'

The statement 'land zero waste certified solution' is confusing and misleading. Is this implying out of sight out of mind? In essence we know that it degrades into small particles that can't be seen but evidence of biodegradation is minimal or uncertain to say the least.

Oxo-degradable bags contain polymers such as polyethylene derived from oil. When these bags degrade to CO_2, they release fossil carbon into the atmosphere. Hence, they have a more negative environmental impact during this phase of the life cycle compared with plastic products made from biopolymers, which

[3] T. O'Brine, R. C. Thompson, Degradation of plastic carrier bags in the marine environment, Marine Pollution Bulletin (2010)

[4] California State University, Chico Research Foundation, Performance Evaluation of Environmentally Degradable Plastic Packaging and Disposable Food Service Ware - Final Report (2007)

[5] Tosin, Maurizio et al., Laboratory Test Methods to Determine the Degradation of Plastics in Marine Environmental Conditions, Frontiers in Microbiology 3 (2012), in Sustainable Packaging Coalition (SPC), Position against Biodegradability Additives for Petroleum-Based Plastics (2015).

[6] Feuilloley, P. et al. Degradation of Polyethylene Designed for Agricultural Purposes. Journal of Polymers and the Environment 13, 349-355 (2005).

are derived from renewable biomass sources such as corn. Consequently, *the use of the term "zero waste" in this CTM is misleading.*

In addition, fragments from oxo-degradables in simulated environmental conditions over time have shown signs of cross-linking. The consequence of cross-linking between the molecular chains in the degraded polyethylene is that it may lead to fragments persisting in the soil[1].

Another concern we have is that it may lead to the Australian public thinking it okay to litter these oxo-labelled products as these will degrade to "zero waste".

In summary we believe these CTMs should not be granted as they are detrimental to the Australian public. They are confusing, ambiguous and misleading.

Broader implications of the use of these CTMs on recycling and disposal of plastics in the overall Australian waste stream[1]

Re-use

The fact that they are degradable limits the re-use of oxo-degradable bags: they are unsuitable for storing items for an extended length of time.

Therefore, the metal ions used as catalysts to degrade the plastic are simply released to the environment and diluted so they cannot be recovered. This is a poor use of an energetically expensive and non-renewable resource.

Recycling

Oxo-degradable plastics are not suitable for recycling with main-stream plastics. The 'recyclate' will contain oxo-degradable additives that will render the product more susceptible to degradation. Although the additive producers suggest that stabilisers can be added to protect against the oxo-degradable additives, it would be problematic for recyclers to determine how much stabiliser needs to be added and to what extent the oxo-degradable plastic has already degraded.

Disposal – Incineration and Landfill

The potential for problems to be caused by incorrect disposal of oxo-degradable plastics means that any packaging should be clearly labelled with the appropriate means of disposal. Life cycle analysis suggests that the best means of disposal for oxo-degradable plastics is incineration. If incineration is not available, then landfill is the next best option.

There is a lack of evidence about what actually happens to oxo-degradable plastics in landfill. It is possible that they will degrade in landfill sites if sufficient oxygen is present, but the most likely scenario is that they remain un-degraded.

Litter

Some oxo-degradable producers maintain that their products are a solution to the littering problem because oxo-degradable packaging will eventually degrade and then biodegrade. However, as the plastics will not degrade for approximately 2-5 years[1], they will still remain visible as litter before they start to degrade.

Lack of Support for Oxo-biodegradable Plastics

A wide range of academics (from universities including California State University, Michigan State University, University of Loughborough), international and governmental institutions (e.g. UN Environment, European Commission, UK Government), testing laboratories (e.g. Organic Waste Systems), trade associations of plastics manufacturers, recyclers and converters (e.g. Plastics Europe, SPI Bioplastics Council, European Plastics Converters), non-profit organisations (e.g. Sustainable Packaging Coalition) and multiple other experts have provided or collected evidence that oxo-degradable plastics are not a solution to plastic packaging pollution, and that they are not suited for effective long-term reuse, recycling at scale or composting[7].

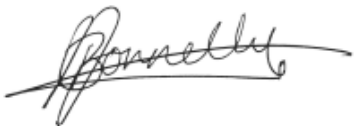
Countries where oxo-degradable plastics are mandatory for certain applications, include the United Arab Emirates, Saudi Arabia, areas of Pakistan, Yemen, Ivory Coast, South Africa, Ghana and Togo[7]. We understand these countries do not have the same rigorous government standards that Australia enjoys.

Any research evidence supporting the claim of effective biodegradation of oxo-biodegradable plastics indicates some tests were performed at temperatures which do not reflect real life environments; some show that a *threshold* in fragmentation is reached after a certain period of time without proving that the biodegradation process will continue and thus be completed (similarly, some conclude effective biodegradation in a potential future by extrapolation of the results); some tests do not make the data on the amount of additive concentration added to the polymer for the test available, although these elements have been proved to highly influence the rate of fragmentation - and hence the extent of biodegradation.

Finally, some of these studies were not performed independently, but on behalf of oxo-degradable additives manufacturers.

In summary we support the conclusions of the New Plastics Economy report[7] – "uncertainties surrounding the effect of oxo-degradable plastics on the conventional plastics recycling process means that the safest solution is to keep oxo-degradable plastics out of mainstream plastics recycling processes. The evidence to date suggests oxo-degradable plastic packaging goes against two core principles of the circular economy: designing out waste and pollution; and keeping products and materials in high-value use. Therefore, we support applying the precautionary principle by banning oxo-degradable plastic packaging from the market."

Signed by



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