

Successful legal action has been taken by the Australian Competition and Consumer Commission (ACCC) against a company that made misleading claims. The court declared "the company had engaged in false or misleading conduct or conduct likely to mislead or deceive, misrepresented the benefits and performance characteristics of the bags and misled the public on the nature and characteristics of the bags". The court prevented the company from "promoting that the bags biodegrade, disintegrate or will be of benefit to the environment, unless it has independent scientific evidence to support such claims".

Source: ACCC Consumer Express July 2004 and Green Marketing and the Trade Practices Act, ACCC 2008

Frequently Asked Questions Degradable Plastics

EXTRACT FROM: MANAGING THE TRANSITION: DEGRADABLE PLASTICS IN NEW ZEALAND – A GUIDE AND INDUSTRY COMMITMENT

1. What are degradable plastics?

Degradable plastics are designed to breakdown over specific timeframes either biologically or mechanically. The defining characteristic is the time [minutes, months, years] it takes to degrade and this determines composting ability as well as reuse and recovery. The length of time depends on the type of degradable material, the end environment, and the conditions it is exposed to including light, heat, microorganisms and water. International composting standards [EN13432, ISO 17088 and AS4736] have been developed to give a timeframe within which the material must degrade in order for it to be labelled as 'compostable'.

2. Are all biodegradable plastics compostable?

No. All compostable plastics are biodegradable [biologically degradable], however, not all biodegradable plastics are compostable within the timeframes or conditions stipulated in the relevant international standards for compostability.

3. Are all degradable plastics made from renewable resources?

No. It is important to understand that biodegradable and non-biodegradable plastics can both be made from biobased/renewable resource materials as well as from synthetic (petrochemicals – fossil fuel) resources.

4. What are the main types of degradable plastic and how do they differ?

Degradable plastics fall into two distinct categories. The first category is made up of plastics which are compostable according to international standards and are typically biologically degradable and so readily attacked and digested by microorganisms early on in their degradation process (within the timescales of the standards). Within this category are home compostable and commercial compostable options.

The second category is made up of plastics that are NOT compostable according to international standards and typically take longer times to degrade. They are typically degraded by a longer multi-step, sequential, process. For example, such a plastic would be (1) first broken down mechanically by chemical attack involving water, air (oxygen), or ultra violet light (sunlight), often with the help of additives which accelerate this chemical attack. Then, in a second step (2) the result of this initial breakdown may provide, ultimately, a small enough size for attack and digestion by microorganisms. Only this second step can be termed "biodegradation".

Plastics which fall into the second category will eventually undergo biological degradation after mechanical degradation, but not within the time/temperature constraints required by current commercial composting systems and standards.

5. What is meant by compostable plastics?

Compostable plastics are those that comply with a recognised composting standard. The most common standard, is the European Industrial Standard EN13432. For a list of the plastics independently verified to conform to known composting standards, in this case EN13432 and the Australian standard AS4736:2006 go to www.pacia.org.au. In the future plastics will be verified to ISO 17088.

6. Will compostable plastics decompose in my home compost bin?

Only if it meets the home composting standard e.g. EN13432 (home OK compost). Home composting conditions are different (lower temperature) to commercial composting conditions. There are separate testing procedures, certification and labelling systems for each.

7. Is biodegradable plastic packaging suitable for home composting?

Typically not, unless the packaging is labelled as suitable for home composting according to international standards.

8. What are the end products of biodegradation and do they have any harmful effects on the environment?

The end products of biodegradation carried out in the presence of air (oxygen) are carbon dioxide, water, mineral salts, and biomass. In the absence of air (oxygen) these products are methane, carbon dioxide, biomass, and mineral salts.

That is one of the reasons for having standards as they determine if biodegraded products qualify for use as compost. These standards look for any side effects from the residual material such as soil fertility and the ability of worms to survive.

9. What are oxodegradable plastics? Are these different?

Oxodegradable plastics are one of a number of materials that fall into the second category of degradable plastics. They are conventional commercial plastics manufactured from petrochemicals (such as polyethylene) with metal and/or other additives (prodegradant) which is designed to accelerate degradation under defined conditions of time, temperature, heat and oxygen (air) and ultra-violet light. Attack by oxygen results in the plastic degrading to a size that can eventually be attacked and digested by microorganisms under certain conditions. In the case of current oxodegradable plastics, this two step process does not meet current commercial or home composting standards (time, heat, air, and water).

10. Is it true that the use of oxodegradable plastics leave residual plastic particles in the soil?

Yes as it does not meet the composting standards as described in EN13432. [Refer to Q4]

There is ongoing research into this area and this document will be updated accordingly.

11. Is it true that oxodegradable plastics will leave residual plastic particles in the oceans and on the seashore?

Yes. Over a prolonged period, the action of sunlight would cause the prodegradant-containing plastic to photodegrade to the point where a product, such as a plastic shopping bag, would disintegrate into smaller and smaller pieces, possibly culminating in non-visible-sized litter. Non prodegradant-treated plastic would typically not degrade under these conditions in the same exposure period.

12. Can oxodegradable plastics be composted?

They do not meet the EN13432 composting standard.

13. Do oxodegradable plastics degrade in landfill?

No. Degradation is not beneficial to landfill sites. [Refer to Q16]

14. Can oxodegradable plastics be used as fuel?

Yes. The presence of the prodegradant additive does not interfere with the way in which polyethylene or polypropylene will burn in a commercial incinerator. Please note plastic is not suitable for burning in domestic fires.

15. Is it better to buy products in “biodegradable” plastic packaging?

Unless the packaging has to be biodegradable to do its job, it's unlikely that biodegradability would impart an advantage. The indiscriminate promotion of the biodegradability of packaging could result in increased littering. There's widespread misconception in the market that if it's biodegradable, then it must be better for the environment than if it's not biodegradable. That's generally misleading. Some people think that if something is biodegradable, it's therefore more sustainable. Not necessarily. Not all biodegradable/compostable plastics are made from renewable resources. [Refer to Q17]

16. Is biodegradable plastic better in a landfill than ordinary plastic?

If disposal to landfill is the only disposal option, most people think something that will “biodegrade” in the landfill is better than something that won't. The reality is the opposite. Unless a landfill is specifically designed to be a bio-digester, intended to generate captive methane from the anaerobic digestion of organic waste and use the methane as fuel, it's much better that the landfill acts as an inert tomb where nothing degrades. That means you have a physically stable landfill without the risk of subsidence and damage to any structures built on the mature land fill site. It also means that the landfill doesn't produce harmful methane which if it is allowed to escape to the atmosphere, is about 25 times more damaging a greenhouse gas than carbon dioxide.

17. Since in most localities in NZ to date, “bioplastics” are not accepted for kerbside collection as a recyclable, then surely I'm better to make my bottle from PET, which is recyclable and therefore more sustainable?

When thinking about the larger issue of environmental impact, it's important to think about the whole lifecycle of the product from design through to disposal. It is better to take a full ‘lifecycle’ approach (considering design, raw materials, manufacture and use) than simply focus on options when you have finished using the product and its packaging.

[See question 19]. For more information refer to the Plastics New Zealand Design for the Environment Guidelines and Appendix 1: Managing the Transition: Degradable Plastics in New Zealand – A Guide and Industry Commitment. www.plastics.org.nz

18. If PLA packaging ends up as litter in a natural water way, how quickly will it biodegrade?

PLA (polylactide) is a member of the polyester plastic family, but based on a renewable resource. For a PLA bottle to break down quickly, you need moisture and elevated temperature. In a natural water way, you'll only have one out of two. Generally, the average temperature day and night will be at a level which would mean biodegradation would take between 2 and 4 years, maybe longer.

19. Can bioplastic packaging be recycled in New Zealand?

In New Zealand bioplastic packaging is currently not accepted in recycling and commercial composting systems. For this situation to change it will require a sufficient volume of bioplastic in the marketplace to ensure the recovery infrastructure can collect it. As with other plastics the implementation and observance of appropriate labelling and collection-sorting facilities can help prevent cross-contamination of plastics recycling streams. Contact the signatories to this guide, Managing the Transition: Degradable Plastics in New Zealand – A Guide and Industry Commitment, for further information.

20. Can degradable plastics interfere with existing recycling systems?

Yes, when recycled degradable plastic is mixed with non degradable plastics this will reduce the performance and life of the final product. [Refer to Q19]

21. Why is it that a plastic bag labelled “100% biodegradable” has not degraded even after prolonged exposure to the weather?

Claims of “100% degradability” or “100% biodegradable” should include a reference to an international standard or the specific time, temperature, water, air exposure conditions required for that claim to be true.

22. As a consumer how do I dispose of plastic bags which are labelled as ‘degradable’?

Plastic bags claiming to be ‘degradable’ cannot be expected to break down under the conditions used in current commercial composting, unless clearly certified as compostable according to international standards, and, if not able to be composted, are recommended to be disposed of as rubbish to landfill.

23. Where do I send my biodegradable plastic waste for composting?

Only plastics meeting international composting standards can be technically considered for composting in New Zealand. At this stage due to cross-contamination with other plastics many commercial operators do not want to accept biodegradable plastic as it has the potential to compromise the quality of the final product.

24. What is a realistic time frame for all plastic products to be made from clean, fully sustainable materials other than oil?

This is not likely to occur in the foreseeable future. The current production of bioplastics is less than 1% of global plastics and is expected to possibly increase to between 2-5% by 2012. This is small in comparison to conventional polyethylene, which is the plastic most commonly used to make commodity products such as shopping bags. It will take some time before polyethylene is replaced by an alternative plastic based on a sustainable feedstock from a renewable resource. Major plastic manufacturers throughout the world continue to research alternatives and new plastics regularly enter the market.

25. What is the difference between ‘renewability’ and ‘sustainability’?

Sources from which plastics can be produced are ‘renewable’ if they can be replaced by natural processes e.g. new plant growth. If these sources are under competitive pressure for use as food or other uses they may not be ‘sustainable’.

26. Are there plastics made from renewable resources that are durable?

Yes, bioplastics strengthened with glass and natural fibres are used in furniture and many non packaging applications where durability is a key feature. For example replacing large metal components in automobiles and other modes of transport with bioplastics has led to major reduction in vehicle weight and an increase in fuel efficiency.

27. Will degradable plastics change the amount of litter or people's littering behaviour?

- Littering is a complex problem created by consumer behaviour, the type of product and packaging and unsuitable infrastructure including bin type, type of container, location and recovery services.
- It is unclear that introducing degradable plastics will change consumer behaviour, and consequently, the amount of litter in the environment.
- There are some concerns that people who are currently likely to litter, would still litter, or may litter more, if they believe that the product will degrade.
- Overall, addressing litter and littering is best managed through a combination of education, infrastructure and enforcement of suitable regulations.