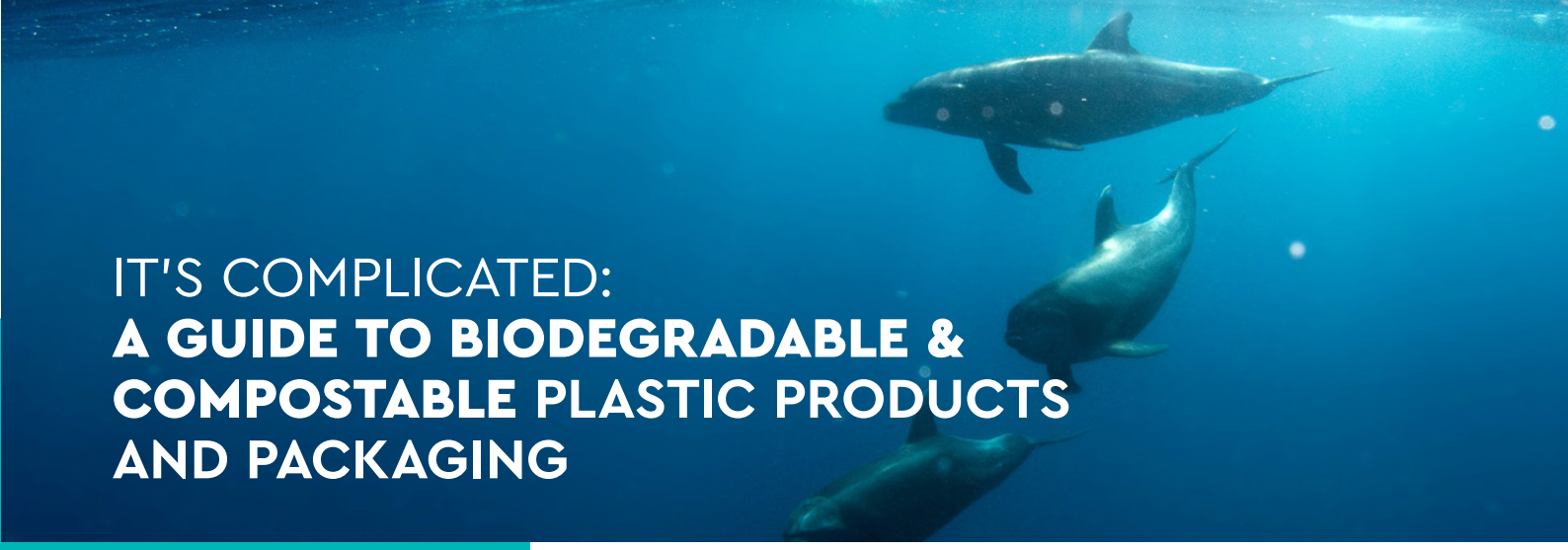


IT'S COMPLICATED:
A GUIDE TO BIODEGRADABLE & COMPOSTABLE PLASTIC PRODUCTS AND PACKAGING

As the backlash against plastic grows, many consumers are looking for products that avoid adding to plastic pollution — especially in the marine environment. However, there is a lot of confusion about the alternatives to traditional plastics and where to dispose of them at their end of life.

THIS GUIDE

Clarifies some of the terminology used for plastic products (plant or fossil fuel based) that are advertised as compostable, biodegradable or degradable

Explains the substantiation (proof) needed to make these claims; and

Provides information about where to dispose of them.

Note: See glossary on the last page for an explanation of *substantiation, landfills and composting*.

Terms used for alternatives to traditional plastics

Plastics are sometimes advertised as being compostable, biodegradable (in specified conditions) or degradable at their end of life.

All plastics exposed to environmental forces or conditions will eventually break into smaller and smaller pieces of plastic (sometimes microplastics) over a long period of time. In specific conditions some plastics will biodegrade to break down into water, carbon dioxide and biomass instead of just breaking down into smaller pieces of plastic. Some plastics are compostable which means they will break down into water, carbon dioxide and biomass over a comparatively short period of time in the right conditions.

DEGRADABLE

Degradable means something can "break down" and includes all types of plastic that can break into little pieces, either over time, by mechanical cutting, shredding or from exposure to environmental forces and ultraviolet light (from the sun), or through pro-degradant additives. Most material will degrade or deteriorate given sufficient time and exposure to the right conditions but in some cases this can take hundreds or thousands of years.

Oxo-degradable products are made from traditional oil-based plastics with a pro-degradant additive to make it fragment into smaller pieces faster than traditional plastic when exposed to sunlight and oxygen.

Plastic waste in open or marine environments can result in persistent microplastics that can enter the food chain, harm aquatic life and take very long periods to finally break down into naturally occurring substances.

Substantiation (proof): There is no internationally recognised certification for degradability or oxo-degradability. Degradable products are sometimes advertised to be "certified degradable" to a standard, such as test guide or method:

Test guides and methods

ASTM D6954-18

Standard Guide for Exposing and Testing Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation

BS 8472

Methods for the assessment of the oxo-biodegradation of plastics and of the phyto-toxicity of the residues in controlled laboratory conditions

Test guides and methods provide a framework or roadmap of steps, criteria, procedures or a general approach but do not provide a pass or fail for degradability or biodegradability.

End of life disposal: Items advertised as degradable, 100% degradable or oxo-degradable must be disposed of in landfill. The environmental impact of degradable and oxo-degradable items when littered is equivalent to the littering of traditional plastics as they can break up in to microplastics. These items should not be recycled (in kerbside collections or in soft plastics) or composted.

Recommendation: If you are at all unsure, our advice would be to avoid packaging that claims to be degradable, 100% degradable or oxo-degradable.

BIODEGRADABLE

Biodegradable means the material is "eaten" by naturally occurring micro-organisms such as bacteria, fungi and algae to produce water, carbon dioxide, and biomass. The process of biodegradation is hugely dependant on the environment. For example, compost, soil, water and marine environments all contain very different micro-organisms and how active these are depends on the amount of oxygen and the temperature of their specific environment.

In our opinion, to advertise that a product is "biodegradable" is misleading if the environment in which it biodegrades is not specified. The maximum time it will take for the product or packaging to totally biodegrade should also be specified. Products are often advertised as biodegradable in commercial composting, home composting and sometime as biodegradable in soil, water or marine environments. However, only commercial composting and home compost claims are well validated.

Commercially Compostable

Some products and packaging are designed to biodegrade in a commercial composting facility within a specific timeframe. To be valid the claims must be backed up against a certification standard.

Substantiation (proof): There are several international commercial composting standards and corresponding verification schemes. A product advertised as meeting one of the standards (see Table 1 on next page) will have been tested according to the specific standard's criteria (including timeframe) and then independently certified by a third-party organisation. Products that meet these standards and have been certified are listed on regularly updated open access databases. See Weblink 1 at the end of this guide to access these databases.

End of life disposal: If an item meets a recognised commercial composting standard it can technically be industrially composted. However, many commercial composters do not accept compostable packaging. Almost all greenwaste processors (see glossary) are unable to accept compostable packaging due to resource consent limitations, or their procees, or the length of their composting cycle. Some industrial composters (see glossary) may also be unable to accept compostable packaging due to the length of their processing cycle or the technology they use.

Check if there are any compostable products or packaging collection services available as some manufacturers have set up their own collection services to take back and dispose of compostable packaging. If there are no compostable products or packaging collection services available, then check if there is a commercial composter in your area that will accept compostable

TABLE 1 : COMMERCIAL COMPOSTING STANDARDS

DESCRIPTION	AUSTRALIAN SEEDLING INDUSTRIAL COMPOSTING	SEEDLING INDUSTRIAL COMPOSTING	OK COMPOST INDUSTRIAL COMPOSTING	DIN INDUSTRIAL	BIODEGRADABLE PRODUCTS INSTITUTE / US COMPOSTING COUNCIL
REGION	Australia / NZ	Europe	Europe	Europe	USA
LOGO					
VERIFICATION	Australasian Bioplastics Association / DIN CERTCO	DIN CERTCO	TÜV Austria	DIN CERTCO	DIN CERTCO
OVER ARCHING STANDARD	AS 4736	EN 13432	EN 13432	EN 13432	ASTM D 6400 OR 6868

TABLE 2 : HOME COMPOSTING STANDARDS

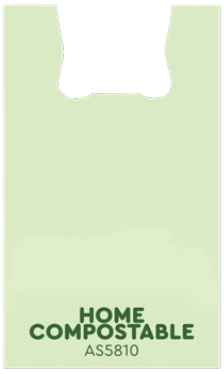
DESCRIPTION	AUSTRALIAN SEEDLING HOME COMPOSTING	OK COMPOST HOME COMPOSTING	DIN HOME
REGION	Australia / NZ	Europe	Europe
LOGO			
VERIFICATION	Australasian Bioplastics Association / DIN CERTCO	TÜV Austria	DIN CERTCO
OVER ARCHING STANDARD	AS 5810	Variation of EN 13432	AS 5810 / NF T 51-800

packaging. See Weblink 2 at the end of this guide.

If there is no commercial composting facility available to take your product it should be disposed of to landfill. They cannot be recycled.

Recommendation: Check that any commercial compostability claims are backed up with one of the certification standards mentioned above. Also check if there are any compostable products or packaging collection services available or a local composting facility willing to accept your products or packaging. See Weblink 2 at the end of this guide for an up-to-date list of commercial composters who are able to accept compostable packaging.

Home composting



Some products and packaging are designed to biodegrade in a home composting system within a specific timeframe. Home composting systems do not reach the same temperatures as commercial composting facilities so something that is claimed to be commercially compostable is not always suitable for home composting systems. To be valid the claims must be backed up by a recognised certification standard.

Certified home compostable bags used for dog waste need to be composted in a separate compost system and the finished product should not be applied to fruit and vegetable gardens.

Substantiation (proof): There are two home compostability standards that mean the product or packaging has been tested according to the specific standard's criteria (including timeframe) and then independently verified by a third-party organisation.

End of life disposal: In a home composting system many factors will affect the speed at which breakdown of a compostable product occurs, including the ratio of green inputs (i.e. food scraps and garden waste) to brown inputs (dry leaves, sawdust, compostable packaging). If you put more compostable packaging in than food waste, for example, the compost may be too dry to break down successfully. It may also be necessary to break the compostable product or packaging into smaller pieces so it breaks down faster. They cannot be recycled.

Recommendation: Check that any claims to home compostability are backed up with one of the certification standards mentioned in Table 2 on previous page.

Soil, water, marine environments

Standards and accredited verification schemes exist for biodegradation in soil, water and marine environments, but these have been developed for products that are specifically designed to be used in these environments (e.g. mulch film, or mussel ropes). There are concerns around the validity of these standards because these environments are more variable than composting. For example, it is difficult to prove that a product advertised as "biodegradable in marine" will biodegrade in all marine environments given the varying degrees of temperature and levels of oxygen present in the sea.

Sometimes a product will be advertised to be "certified biodegradable" to a standard, such as ASTM D6954. However, this is a test guide only, and, along with other test guides, should be used only to compare the performance of different materials rather than to indicate a pass or fail of "biodegradability".

Test methods that indicate how to measure biodegradation in a simulated landfill environment also exist. However, landfill environments are variable and as with test guides, there is no pass or fail requirement in the standard test method. This means there is no way to be sure if a material that is advertised as being biodegradable in landfill, will biodegrade in a real landfill environment.

As the test methods in Table 3, and test guides (such as ASTM D6954), do not indicate a pass or fail we consider it would be misleading to add these in promotional material as it would imply the product has some form of environmental benefit.

TABLE 3 : TEST METHODS

TEST METHODS	PURPOSE	DATA OBTAINED
ASTM D5511	Anaerobic biodegradation of plastic materials under high-solids anaerobic digestion conditions	Test duration, % landfill biodegradation
ASTM D5988	Soil biodegradability	Test duration, % soil biodegradation
ASTM D6691	Marine biodegradation	Test duration, % marine biodegradation

NB: Test methodologies provide standardised guidelines on how to conduct testing but do not provide a pass or fail for degradability or biodegradability.

End of life disposal: Any item that claims to be biodegradable only in soil, water or marine environment must be disposed of in landfill. They cannot be composted or recycled.

Recommendation: Our advice is to avoid any products or packaging advertised only as degradable, biodegradable, totally degradable, oxo-degradable or as biodegradable in soil, water or marine environments, or as biodegradable in landfill.

GLOSSARY

Commercial Composting

Commercial composting facilities operate at much higher temperatures then the average home compost system. In New Zealand, commercial composters generally use windrow, vermicomposting or In-vessel methods. The compostable items that go into a commercial composting system are called feedstock. Composting facilities need to apply for resource consent to operate and the conditions of the resource consent can limit and/or restrict the type of feedstock they can accept. Having organic certification additionally restricts the types of feedstocks accepted. Composting facilities in New Zealand can generally be classified as:

1. Greenwaste processing facilities. These facilities process garden waste, bark and wood chip to make compost or mulch and generally don't have resource consent or an appropriate composting process to accept food waste or compostable packaging.

2. Industrial composting facilities. These facilities process more complex waste streams such as food waste, waste from abattoirs or fish processing facilities, sludge etc and are more likely to be able to process compostable packaging (but don't necessarily accept it).

Home Composting

Home composting systems vary greatly in terms of methods used, the mean temperature it reaches and the ratio of carbon rich material (i.e, compostable packaging, cardboard, paper towels, leaves) and nitrogen rich material (i.e, fruit and vegetable kitchen scraps, lawn clippings, egg shells, coffee grounds, tea leaves). If you are new to home composting there is a wealth of information on the internet as well as in local communities.

Landfills

Modern landfills differ from the old dumps that used to be common in New Zealand. Modern landfills are engineered to protect the environment from leachate and landfill gases which are produced when waste degrades. Waste with a high organic content may still degrade within a landfill, however, this process occurs differently from a composting facility and requires engineering controls to manage the potential adverse impacts on the environment.

Some modern landfills are consciously designed as a biodigester, where organic matter, particularly food and green waste, is anaerobically degraded and the resulting methane is used for power generation or heating. There are test methods that measure the biodegradation of products in biologically active landfills. However, these are not pass or fail measures and are not applicable to all landfills so claims that a product "breaks down faster in landfill" are misleading and cannot be substantiated.

Substantiation (proof)

Under the Fair Trading Act 1986 a company making a claim about a product being biodegradable, degradable or compostable needs to substantiate this (i.e., prove the claim) with reputable evidence. The trader must have reasonable grounds to make the claim at the time it is made. Companies who fail to substantiate environmental claims may be prosecuted under the Fair Trading Act. The Commerce Commission websites states:

If you make environmental claims — such as about sustainability, recycling, carbon neutrality, energy efficiency, use of natural products or impact on animals and the natural environment — these must be accurate, scientifically sound and able to be substantiated.

The Advertising Standards Authority (ASA) also has an "Advertising Standards Code" which applies to all advertisements in all media. This code requires, amongst other principles, that advertising (including website and social media content):

"must not mislead or be likely to mislead, deceive or confuse consumers, abuse their trust or exploit their lack of knowledge. Equally, advertisements must not use tests, surveys, research results or quotations from technical and scientific literature in a manner which is misleading or deceptive."

Advertising that fails to reflect the principles of this code may receive a complaint. If the complaint is upheld by the ASA Complaints Board, the advertiser is expected to remove the advertisement.

Still unsure what substantiation means? Check out the super handy video from the Commerce Commission at comcom.govt.nz.

For further legislation that may be applicable in the event of false advertising and supply of goods see the Consumer Guarantees Act 1993 and the Contract and Commercial Law Act 2017.

WEB LINKS

1. Access to compostable packaging databases is bit.ly/compostable-packaging
2. List of commercial composting facilities in NZ who accept compostable packaging is bit.ly/composting-facilities

DISCLAIMER

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