

Definitions

The world of green, like any other industry, has its own language - for the person trying to make conscious environmental changes to their life, it can get awfully confusing - take for instance the terms degradable, biodegradable and compostable when used in relation to plastics. There is a difference between the terms and it may play a role in your purchase decisions.

<p>Degradable</p>	<p>Degradable plastic are oil based and break down through chemical reactions rather than the activity of micro-organisms, so they can degrade in an anaerobic environment into water, CO₂, biomass and trace elements.</p> <p>Degradable plastic includes all classes of degradable plastic including the biodegradable and compostable. However, plastic that is not biodegradable or compostable usually use the label “Degradable plastic”. Most of the products using the label “Degradable plastic”, degrade as a result of physical and chemical impact (fracture into smaller pieces of plastic). Biological activity is not a significant part of the degradation of these products.</p>
<p>Biodegradable</p>	<p>Any organic substance capable of being broken down by micro-organisms in the presence of oxygen (aerobic) to carbon dioxide , water biomass and mineral salts or any other elements that are present (Mineralisation). Alternatively, any organic substance able to be broken down without the presence of oxygen (anaerobic) to carbon dioxide, methane, water and biomass over a period of time (up to 2-3 years in a landfill).</p>
<p>Oxo-biodegradable</p>	<p>A very small amount of pro-degradant additive is introduced into the conventional manufacturing process, thereby changing the behavior of the plastic. The plastic should be consumed by bacteria and fungi after the additive has reduced the molecular structure to a level which permits living micro-organisms access to the carbon and hydrogen. The material has then ceased to be a plastic and has become a food source. This process should continue until the material has biodegraded to nothing more than CO₂, water and humus. It does not leave fragments of petro-polymers in the soil.</p> <p>Oxo-biodegradable plastics are currently made from naphtha, which is a by product of oil refining, and oil is of course a finite resource.</p>
<p>Hydro-biodegradable</p>	<p>Hydro biodegradation is initiated by hydrolysis and in the depths of a landfill hydrobiodegradable plastics generate copious quantities of methane by anaerobic biodegradation. Methane is 23 times more potent for global warming than CO₂.</p> <p>Hydrobiodegradable plastics are not genuinely renewable because the process of making them from crops is itself a significant user of hydrocarbon</p>

	energy and a producer therefore of greenhouse gases. They are sometimes described as made from “non-food” crops, but are in fact usually made from food crops.
Photo-biodegradable	In photo-biodegradable plastics the structure of the polymer is altered by UV light in sunlight so that it is now amenable to biodegradation. In other words, the plastics contain an additive which causes the plastic to degrade under conditions of ultraviolet light and oxygen, degrading the chemical bond or link in the polymer or chemical structure of a plastic.
Compostable	Compostable matter should not produce any toxic material and should be able to support plant life. Compostable items are made from plant materials such as corn, potato, cellulose, soy and sugar and are capable of being broken down by aerobic and anaerobic means to make compost. <i>(Anaerobic: in the presence of air)</i> <i>(Anaerobic: in the absence of air)</i>
Water Soluble	Polymer capable of dissolving in water.
Biomass	The term <i>biomass</i> means any plant-derived organic matter. Biomass available for energy on a sustainable basis includes herbaceous and woody energy crops, agricultural food and feed crops, agricultural crop wastes and residues, wood wastes and residues, aquatic plants, and other waste materials including some municipal wastes.
Bio-plastics	Biomass-based plastics are derived from renewable resources.

Comparison of Oxo-Biodegradable and Hydro-Biodegradable Plastics

OXO	HYDRO
Usually made from a by-product of oil-refining	Made from fossil fuel-derived polymers and starch
Can be recycled as part of a normal plastic waste stream	Damages recycle stream unless extracted from Feedstock
Can be made from recycled plastic	Cannot be made from recyclate
Emits CO2 slowly while degrading and forms biomass	Emits CO2 rapidly while degrading
Inert deep in landfill	Can emit methane in landfill
Can use same machinery as for conventional plastic	Needs special machinery
Suitable for use in high-speed machinery	Not suitable
Can be compostable	Compostable
Little or no on-cost	Four or five times more expensive than conventional plastic
Same strength as conventional plastic	Weaker than conventional plastic
Same weight as conventional plastic	Heavier
Leak-proof	Prone to leakage
Degrades anywhere on land or sea	Degrades only in high-microbial environment

Time to degrade can be set at manufacture	Cannot be controlled
Safe for food contact	Safe for food contact
No PCB's Organo-chlorines, or "heavy metals"	No PCB's Organo-chlorines, or "heavy metals"
Can be incinerated with high energy-recovery	Can be incinerated, but lower calorific value
Production uses no fertilisers, pesticides or water	Production uses fertilisers, pesticides and water