

## The Concept of Degradable Plastic

Item	Photodegradable plastics	Disintegratable Plastics	Biodegradable Plastics
<b>Ingredient</b>	Conventional plastics (PS, PP, PE, PVC etc) + light (photo) sensitive substances	Conventional plastics (PS, PP, PE, PVC etc) + starch	Based on natural polymer or aliphatic polyester such as starch, fiber protein and polylactide
<b>Product Processing methods</b>	Photodegradable products are manufactured from conventional plastic pellets (PS, PP, PE, PVC etc) adding light (photo) sensitive substances.	<ol style="list-style-type: none"> <li>1. It is a pelletised master batch manufactured by blending 80% starch and 20% plastic pellets (PS, PP, PE, PVC etc). It can not be processed alone.</li> <li>2. To allow processing, the former would have to be mixed with 70 – 80% conventional plastic pellets to produce disintegratable products. These disintegratable products are manufactured using 70 – 80% conventional plastic pellets, adding 20 – 30% of master batch that can not be processed alone.</li> </ol>	<ol style="list-style-type: none"> <li>1. Biodegradable pellets are made of natural polymer or aliphatic polyester</li> <li>2. Biodegradable products are directly manufactured from biodegradable pellets (without adding any conventional plastic pellets)</li> </ol>
<b>Principle of degradation</b>	Ultraviolet radiation from sunlight exposure	Microorganism	Microorganism
<b>Advantages and disadvantages</b>	<p>Disadvantages</p> <ol style="list-style-type: none"> <li>1. Degradation only occurs under exposure to sunlight. It will not degrade in any other environment</li> <li>2. The photosensitive substances are toxic and damage the environment.</li> <li>3. Plastic fragments become residue after the degradation. The properties remain the same.</li> <li>4. It is possible that the consumer will think that they are completely biodegradable and throw it away, causing environmental pollution</li> </ol>	<p>Disadvantages</p> <ol style="list-style-type: none"> <li>1. It cannot be completely degraded in the landfill. Only starch in the product will degrade. The remaining plastic fragments and particles after degradation become more difficult to collect than before degradation.</li> <li>2. It will release toxic substances when burnt incompletely. This does not meet environmental standards and trends.</li> </ol>	<p>Advantages</p> <ol style="list-style-type: none"> <li>1. Material is made from natural renewable resources and is non toxic.</li> <li>2. It's disposal method (incineration, landfill, recycle and composting) will not cause any environmental damage</li> <li>3. It can replace conventional plastics based on petroleum. It's physical and mechanical properties are similar to conventional plastics.</li> <li>4. It will degrade completely after disposal in compost or landfill.</li> </ol>
<b>REMARK</b>	Do not be misled by some manufacturers promoting their products as biodegradable. Many products such as shopping bags, supermarket bags etc are made using petroleum based plastics with additives to make them degrade. Firstly, the product is sourced from a non renewable resource and in its manufacture, creates ozone depleting toxic gases. When disposed of in to landfills, it will only partially degrade with the remaining substances contributing to leachate. If incinerated, it will release toxic gases.		