

Environmental plastics options

Compared with paper, plastic bags are perceived as damaging the environment due to their lack of biodegradability, but if they're made with **AddiFlex®**, they biodegrade more efficiently.

When considering the environmental impact of certain types of plastics, particularly when it comes to short-life, or single- and multiple-use plastics, there are several factors to consider: sustainability, recyclability, disposability, and cost.

As well as these, it's important to remember the overall impact rather than simply isolating one particular aspect, such as biodegradability or bio-based materials, for example. Ideally, full life-cycle analyses (LCAs) should be conducted, but this is not always practical, although we can consider several key components on which data is readily available.

One of these is how far plastics containing AddiFlex comply with ASTM D-6954. To find this out, plastics containing AddiFlex have been tested according to a standard guide for exposing and testing plastics that degrade by a combination of oxidation and biodegradation. ASTM D-6954 is a three-tiered testing procedure to find out initial abiotic degradation, biodegradation and ecotoxicity. Here are the results:

Tier 1 – abiotic degradation leading to fragmentation.

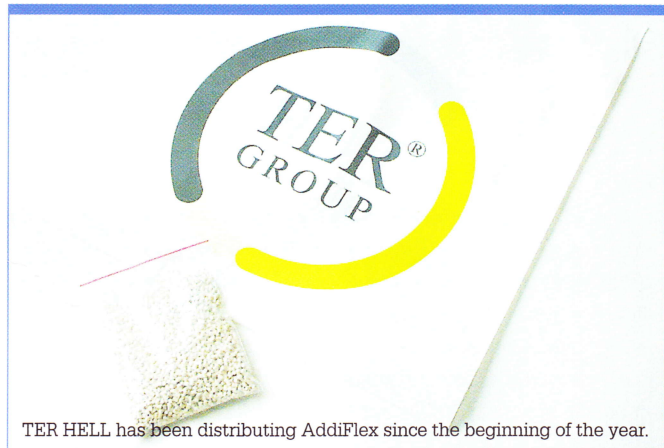
Plastics containing AddiFlex have been tested numerous times according to ASTM procedure D-5208, Practice for Fluorescent Ultraviolet (UV) Exposure of Photodegradable Plastics, and ASTM procedure D-5510, Practice for Heat Ageing of Oxidatively Degradable Plastics. Complete fragmentation has been proven.

Tier 2 – biometer test for biodegradation of all fragments in environment of choice.

Biodegradation, measured by carbon dioxide evolution, has been proven using a procedure similar to ASTM D-5338. The level of biodegradation was over 60% in 180 days.

Tier 3 – ecotoxicity.

There are two elements to the requirements for lack of ecotoxicity. Firstly there need to be no levels of heavy metals above the accepted guidelines. In the case of AddiFlex the results were as described in the table below. All analysed heavy metals in the polymer film with AddiFlex were below the limits, according to D-54900. ASTM D-6954 also requires a plant growth test according to OECD Guideline 208. The results from tests with



TER HELL has been distributing AddiFlex since the beginning of the year.

plastics containing AddiFlex show that the plant growth requirements of the EN13432 Standards have been surpassed.

Because it has a built-in stability time, products made using AddiFlex can be recycled in existing recycling streams unlike hydro-biodegradable/compostable plastics where as little as 1% can cause disastrous contamination to recycling streams. Because the addition rate of AddiFlex in general applications is so low, there is a negligible effect on the LCA; and PE with AddiFlex has the same environmental credentials as standard PE. Furthermore, since the addition rate is so low, the incremental cost is very small and is sometimes absorbed by the producer. One application using the AddiFlex system is the outer milk packaging from Natrël and as AddiFlex has Health Canada approval, all AddiFlex-modified products can be used in direct contact with dairy and other food products.

TER HELL & CO GMBH, Hamburg, distributes AddiFlex

Additives make standard plastics biodegradable and with the help of intelligent system solutions environmental specifications can be efficiently met. Since the beginning of the year, the distribution, production and trading corporation TER HELL has been distributing AddiFlex. The manufacturer of this eco-intelligent additive system solution is the Swedish company Add-X Biotech AB. With the help of such innovative additives, packaging materials such as standard plastics become oxo-biodegradable. During the degradation process, the long polymers disintegrate into water, carbon dioxide and biomass. This allows packaging manufacturers around the world to actively support and conform to stringent environmental specifications. What's more, the optimised application of AddiFlex to products reduces the levels of raw materials and energy required during the production process. ■

Metals in the polymer film with Addiflex were below limits		
Heavy metal	Amount found in the polymer film with 20% Addiflex (mg/kg)	Limits according to DIN 54,900 (mg/kg)
Lead	<2.3	30
Chromium	<1.0	30
Nickel	<0.5	15
Zinc	20	100
Cadmium	<0.1	0.3
Copper	<2.0	22.5
Mercury	<0.23	0.3

Source: Add-X Biotech AB

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