Product Data Sheet

BioXpand

New Gen of Biodegradable Films for Food and Non-food Applications

Product Description

BioXpand is a range of a new Generation of films specifically designed with the ability to safely biodegrade on land if accidently leaked into the natural environment. It is available in the following types of plastic packaging films:

- PE (LLDPE, LDPE)
- BOPP
- Cast PP

These films are formulated with a new biodegradation technology activated by the synergetic action of all agents of decay i.e., air, light, heat, moisture and microorganisms. It chemically transforms the polymer chains into bio-available oligomers in a way that naturally occurring Bacteria and Fungi on land will be able to access and fully convert into CO2, water and biomass in a reasonable length of time. Unlike Oxo-degradable films, ***BioXpand*** films do not leave microplastic behind upon degradation. Furthermore, they do not present any potential harm to the environment across the entire process. The films comply with existing standards for food contact applications.

The degradability performance of these films is assessed under an augmented version of the global standard ASTM D6954 which includes stringent pass/fail criteria on molecular weight, Carbonyl Index and eco-toxicity.

Benefits/Features

- Non-Oxo-degradable additive, no toxic microplastics left behind post degradation.
- Adjustable onset of degradation, typically from 6 months to up to 36 months from the point of production.
- No compromise on processability during the conversion process and on final product properties.
- Complies with existing food safety standards.
- Complies with ISO14021:2016.
- No negative environmental impact at any stage of the process.
- Compatible with recycling within the product's service life.

Biodegradability performance

Pass/Fail Criteria and Typical Performance on PE, BOPP and Cast PP

Parameters	Unit	Test method	Pass level	LLDPE, LDPE [5]	Cast PP [6]	BOPP [7]
Tier 1 - Abiotic Degradation (ASTM D6954)						
Elongation @ break	%	ASTM D3826	< 5%	< 5%	< 5%	< 5%
Carbonyl Index	n/a	FTIR [4]	≥ 1	2.5	2.4	1.2
Reduction in weight average weight (Mw)	%	ASTM D6467	≥ 90% of its initial value	97%	99%	97%
Number average molecular weight (Mn)	Da	ASTM D6467	< 5000 Da	822 Da	921 Da	1850 Da
Tier1b - Post-Degradation Eco-toxicity tests (OECD standards)						
Earthworm acute toxicity & reproduction	n/a	OECD 207, 222	Compliance	Compliant	Compliant	Compliant
Aquatic Eco-toxicity	n/a	OECD 211, 202	Compliance	Compliant	Compliant	Compliant
Tier2 – Biodegradation: Time scale for complete conversion of carbons into C02 on land (ASTM D5988)						
Organic carbon conversion to C02	%	ASTM D5988	≥ 90%	Up to 24 months	Up to 24 months	Up to 24 months

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[4] Measured as A (1850-1650)/A (1510-1410)
[5] 25µm 3-layer coextruded LLDPE/LDPE film
[6] 30µm 3-layer coextruded PP cast film
[7] 25µm 5-layer coextruded BOPP film

Application scope

- Primary film-based packaging
  - The thin “self-service” PE bags for fruit and veggies.

- Sweet snacks and cutlery
  - Wrapping.

- Secondary packaging
  - Shrink Wrap;
  - Stretch Film.

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- BOPP, e.g.
  - Crisps, snacks, nuts;
  - Biscuits;
  - Flow pack of fresh cut salad, vegetables and meat.

For further information please contact:

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