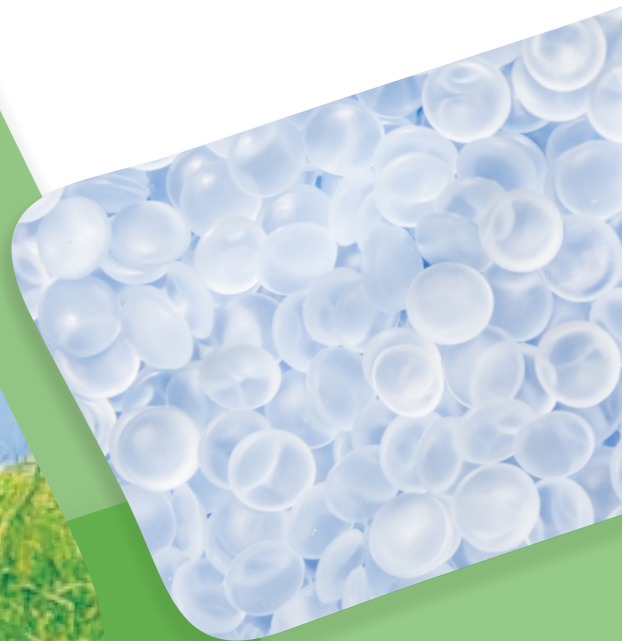


Oxo-Biodegrade Polyolefin Shrink Film

The path to green packaging



- > *Controlled Life Film*
- > *Unaffected Film Properties*
- > *No Toxic Residues*
- > *No Microplastics*

After years of development, we are now able to offer polyolefin shrink film with oxo-biodegradable attributes. As an intelligent film, it automatically self-destructs at a predetermined time. Meanwhile, the normal properties of the film are maintained. The film's flexibility, strength, seal ability, print ability and processing speeds all are unaffected.

"The latest in a long line of published scientific work over 40 years proving that oxo-biodegradable plastic does not just fragment into tiny pieces but does actually degrade, then biodegrade, under conditions expected in the open environment, i.e., with access to oxygen and bacteria."

From Oxo-biodegradable Plastics Association, London.



The path to green packaging

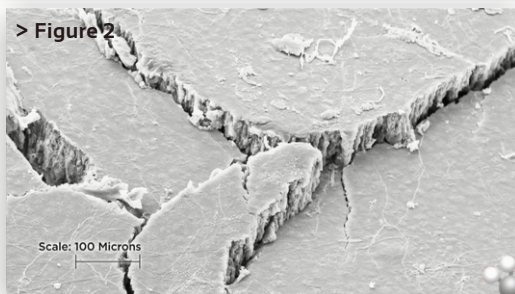
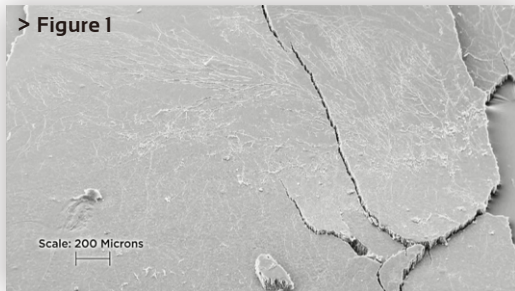


Figure 1 & 2

Seen through an electron microscope, at the end of its predetermined service life the film starts degrading by molecular chains break down. Molecular-weight reduction is a critical factor for rate and extent of biodegradability.

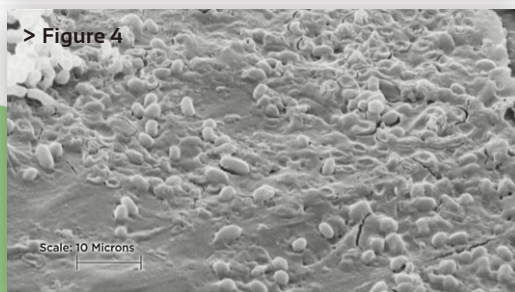
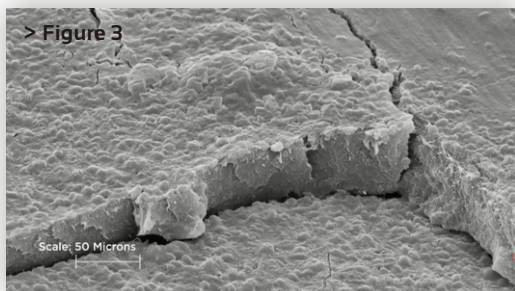


Figure 3 & 4

Microorganisms are colonizing the lower molecular mass residues, the material effectively becomes water wettable and micro-organisms can access the carbon and hydrogen of the intermediate polymer. At this stage the material is no longer a plastic but has become a material capable of bio-assimilation.

Oxo-biodegradable polyolefin shrink film looks and behaves exactly the same as normal films until the end of the service life of the film which was decided at the time of manufacture. The film will automatically break down the long entangled molecular structure of the polymer and forms harmless intermediates that are biodegradable.

Timeframe for degradation depends upon environmental conditions and requires oxygen to be present, and will be accelerated by ultraviolet light and heat in the open environment. It does not need to be composted, the plastic can be recycled if collected before the end of its service life.

At or about the predetermined time, the molecular weight of the polymer starts to descend quickly from around two hundred thousand to one hundred thousand daltons and the material starts to fall apart. The relentless descent continues past 40,000 units and from there the material is no longer plastics.

Microorganisms which are normally found in the environment can then access the fragments and they are bio-assimilated in the same way as natural waste such as leaves and straw. Finally they convert the original components of the plastic to carbon dioxide, water, and biomass, leaving no harmful residues.



PE - LD



RECYCLABLE



FOOD GRADE



COMPLIANCE



APPROVED

Oxo-Biodegrade Polyolefin Shrink Film

The path to green packaging

Technical Data Sheet						
Property	Unit	Test Method	Representative Value			
Physical Property						
Thickness	Micron		12.5	15	19	25
Tensile Property (MD/TD)						
Tensile Strength	N/mm²	ASTM D882	105/105	105/105	105/105	95/95
Elongation at Break	%	ASTM D882	105/105	115/115	120/120	130/130
Seal Strength	180°CN/15mm	ASTM F88	15.7	17.3	21.8	26.9
Tear	g	ASTM D1922	11.3	14.9	17.9	24.5
COF	Film to Film	ASTM D1894	0.20	0.18	0.19	0.21
Free Shrink at 110°C	%	ASTM D2732	59/63	55/61	53/60	52/58
Free Shrink at 120°C	%	ASTM D2732	73/72	72/71	70/69	68/68
Standard Roll Specs						
Width	mm		150-2000			
Length/Roll	SW (singlewound)		3200m	2665m	2135m	1600m
	CF (centerfold)		1600m	1332m	1067m	800m

Note: These values above are average test values to be used for reference information, subject to possible variations. Oxo-biodegradable polyolefin shrink should be used within 18 months of the manufacturing date. Please store in carton, in dry conditions, out of direct sunlight and at a temperature below 35°C or 95°F.

Q: What is the shelf life for Oxo-biodegradable polyolefin shrink film?

A: It takes about two years of exposure to oxygen, and by adding one or more degradation accelerators (ultraviolet light, heat, microorganisms) for our films to degrade. If the films are kept inside they will receive minimal or no exposure and will last much longer.

Q: Why does it take two years for the films to degrade?

A: Two-year is an estimation based on the average conditions. The actual amount of time required to degrade the film will be longer or shorter depending on the amount of exposure to oxygen and the accelerators mentioned above.

Q: What happens to oxo-biodegradable films in a landfill?

A: Microorganisms present in a landfill will aid in the degradation process provided sufficient oxygen is present.