



Bi  **Sphere**[®]
changing the way of life



BioSphere 201: Pelletized Additive

BioSphere 302: Liquid Additive

BioSphere Custom Powder forms available on Request.

All Additive Forms contain Bio-based Content, are Printable, Weldable, and certified Biodegradable Worldwide.

BioSphere is changing history by developing a simple waste solution.

Advantages: BioSphere additive when added at .5% - 10% by load weight encourages microbial biodegradation of the polymer.

BioSphere additive can be used in a range of applications from foamed products to garbage bags. Furthermore, manufacturers can use BioSphere additive in almost all major polymers. Including PP, PE, PS, PET, PC, TPU's, TPR's, ABS, HIPS, GPPS, GPPP, SAN, Nitrile, Rubber and more.

Industry Proven

Technology:

ASTM Standards

ISO Standards

AU Standards

INDIA Standards

EU Directives

High Performance: Biosphere additive is not like any other additive in the marketplace. The unique design of the additive supports thermo-stability up to 280C. This allows for a broad range of product acceptance. BioSphere does not utilize any carrier resins in the mixture as our components have been enhanced and engineered for high thermo-stability. This provides a high performance, low cost solution to making products biodegradable with the highest

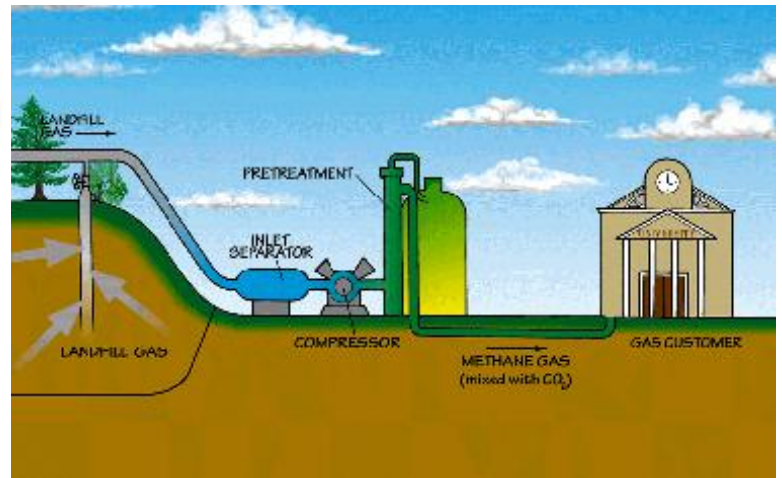
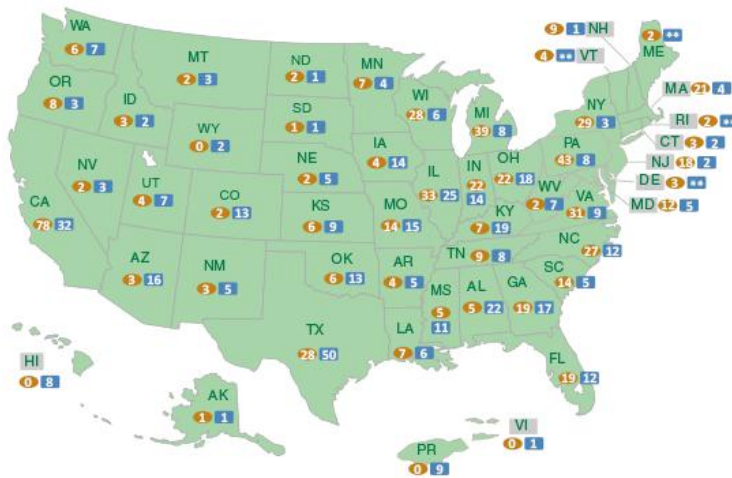
Development and working together with Industry.

BioSphere Plastic is the leading provider of innovative solutions to the plastic industry. The team at BioSphere is researching and developing affordable and cost neutral solutions to the overwhelming problems of plastic waste.



BioSphere strives to develop innovative solutions to the problems of waste by working internally within BioSphere as well as with external partners. The development of Biodegradable additives and resins which are low cost solutions to the plastic waste epidemic. BioSphere strives to lead the world in biodegradable technologies by first listening to their customers and industry partners on the cost acceptance of environmentally friendly plastic.

In response, BioSphere has developed three products which have become affordable environmental solutions to the plastic waste stream. Our team continues to develop novel applications for waste streams and the plastic industry working with our customers and industry partners.



Nationwide Summary
621 OPERATIONAL Projects
 (1,978 MW and 311 mmscfd)
 ~450 CANDIDATE Landfills
 (850 MW or 470 mmscfd,
 36 MMTCO₂e/yr Potential)

OPERATIONAL PROJECTS
CANDIDATE LANDFILLS*

*Landfill is accepting waste or has been closed 5 years or less, has at least 1 mm tons of waste, and does not have an operational, under-construction, or planned project; can also be designated based on actual interest by the site.

These data are from LMOP's database as of July 16, 2013.

** LMOP does not have any information on candidate landfills in this state.

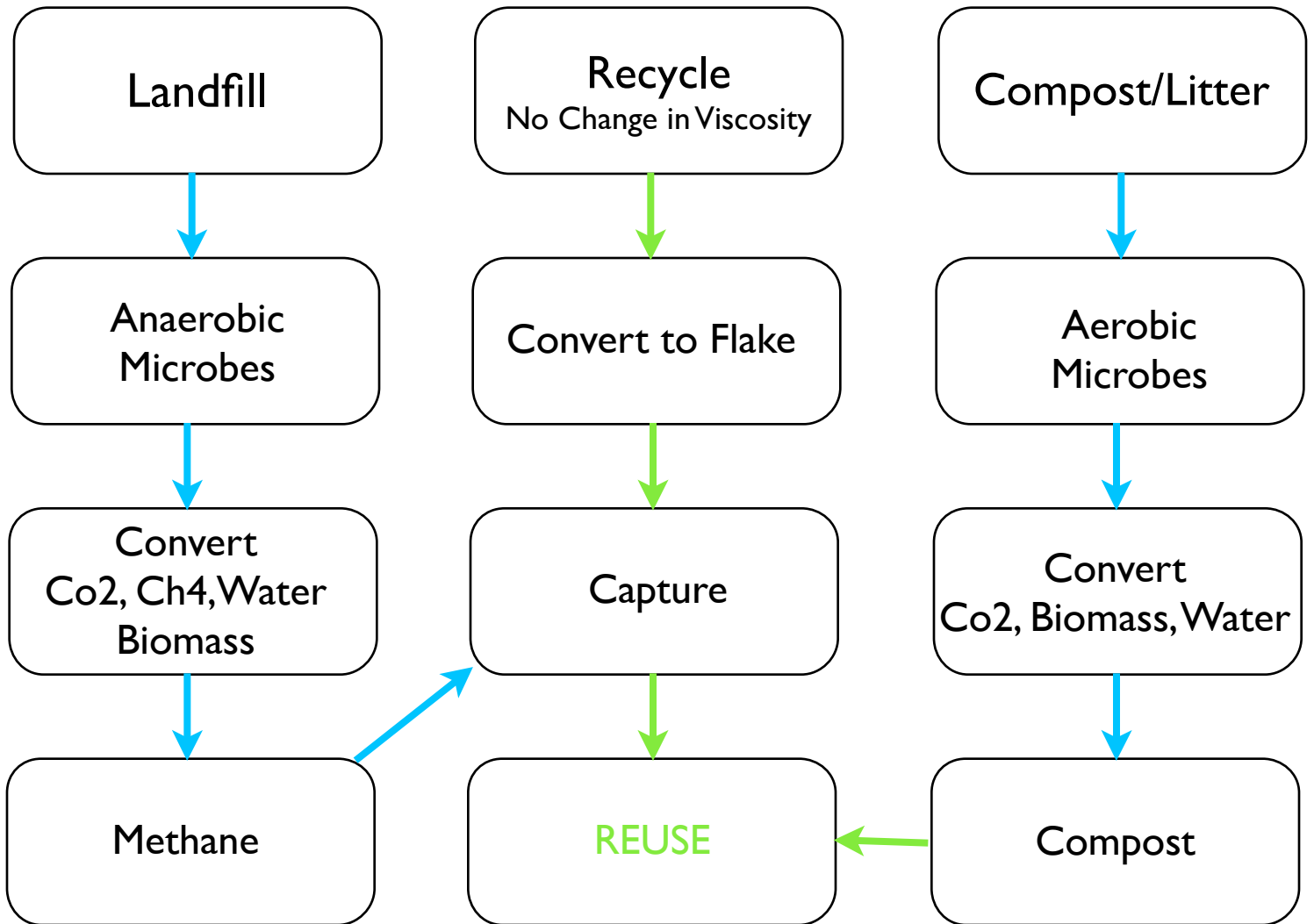
How it works

Municipal waste contains about 150 to 250 kg of organic carbon per ton. These substances are biologically degradable and are converted by microorganisms into landfill gas. Stable, anaerobic methane fermentation begins one to two years after the waste is deposited in the landfill.

Following a simple rule of thumb, 1 million tons of deposited municipal solid waste will produce landfill gas over a twenty-year period—an amount sufficient to fuel a gas engine capacity of 1 MW.

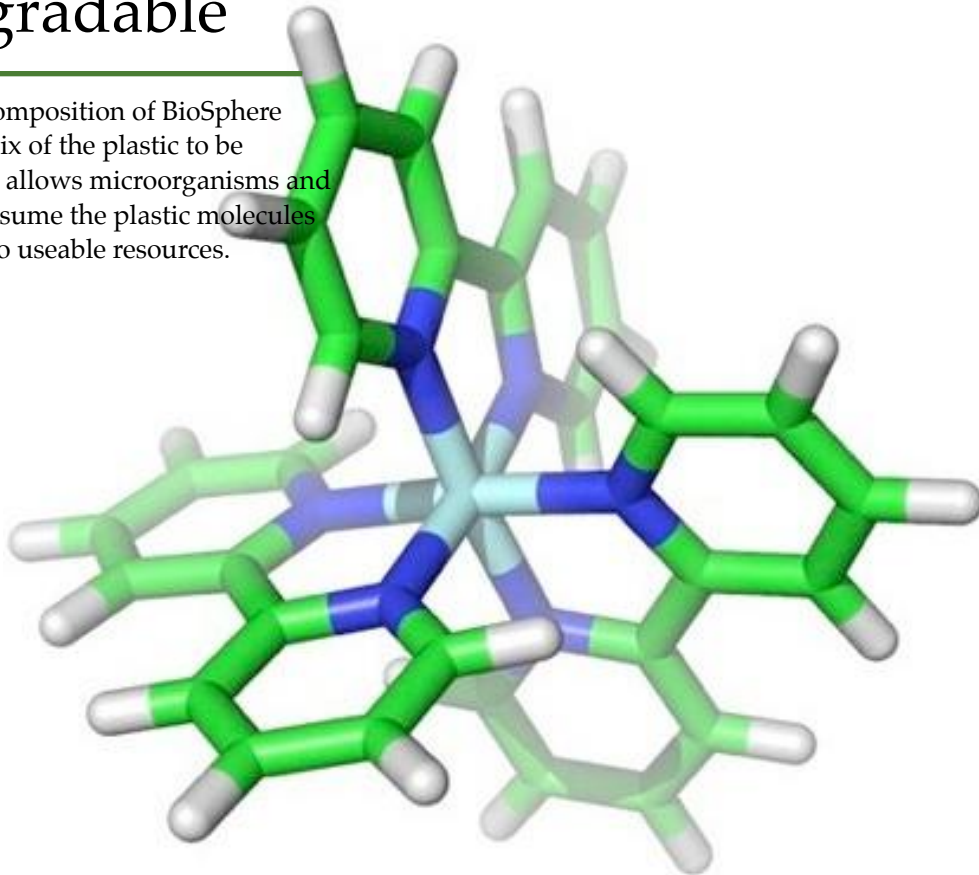
1. Perforated tubes are drilled into the landfill body and interconnected by a pipe work system.
2. Using a blower, the gas is sucked from the landfill, compressed, dried and fed into the gas engine.
3. In most cases, the generated electrical power is fed into the public grid.
4. Since there is no buyer for the heat output in most cases, the thermal energy could be converted into further electrical power.

One Product: Three Solutions



Biodegradable

The chemical composition of BioSphere allows the matrix of the plastic to be converted. This allows microorganisms and enzymes to consume the plastic molecules and convert it to useable resources.



Tested and Certified

BioSphere Plastic is certified in most countries worldwide.

Under these testing methods and standards:

ASTM D5511-02

ASTM D5511-12

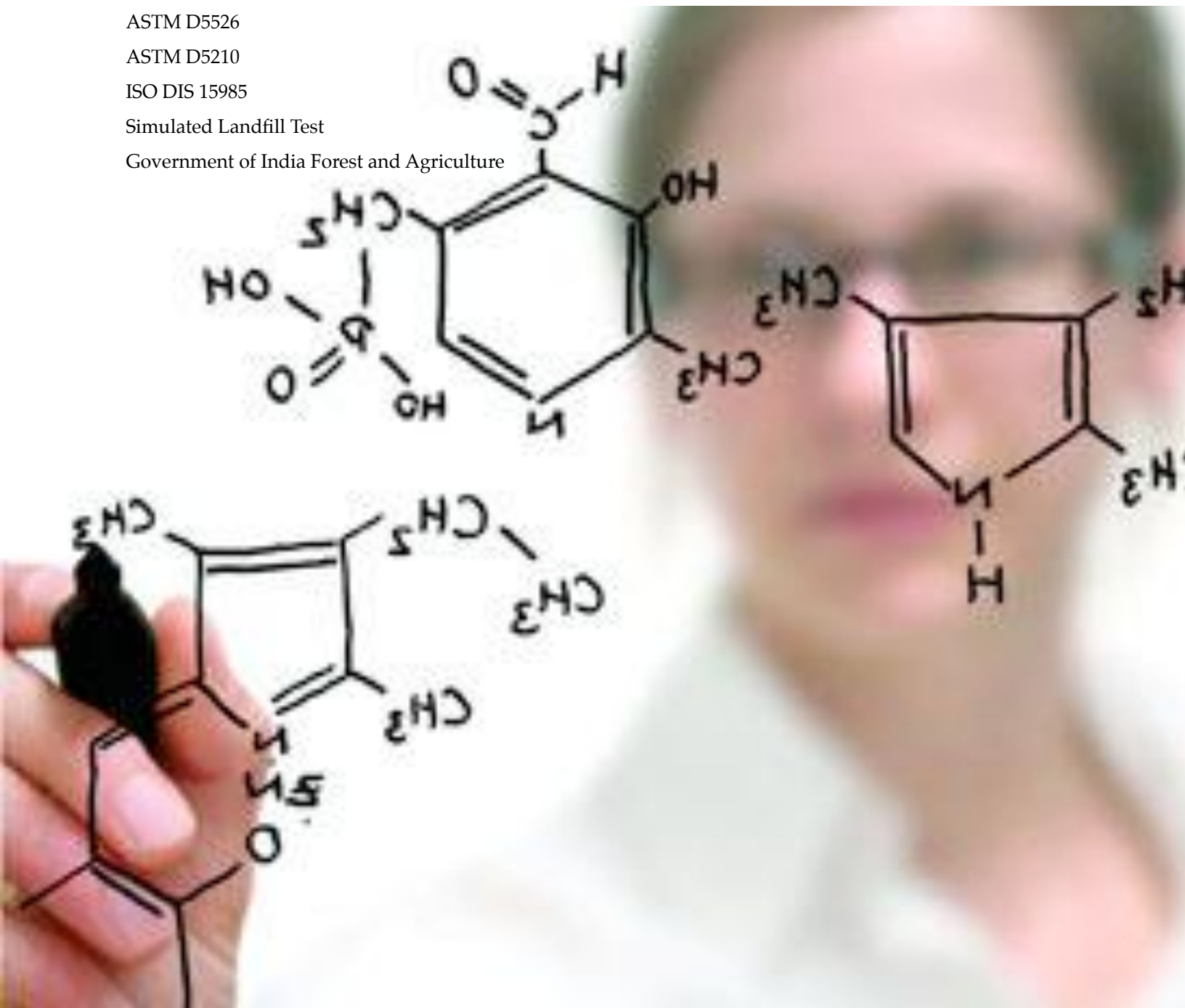
ASTM D5526

ASTM D5210

ISO DIS 15985

Simulated Landfill Test

Government of India Forest and Agriculture



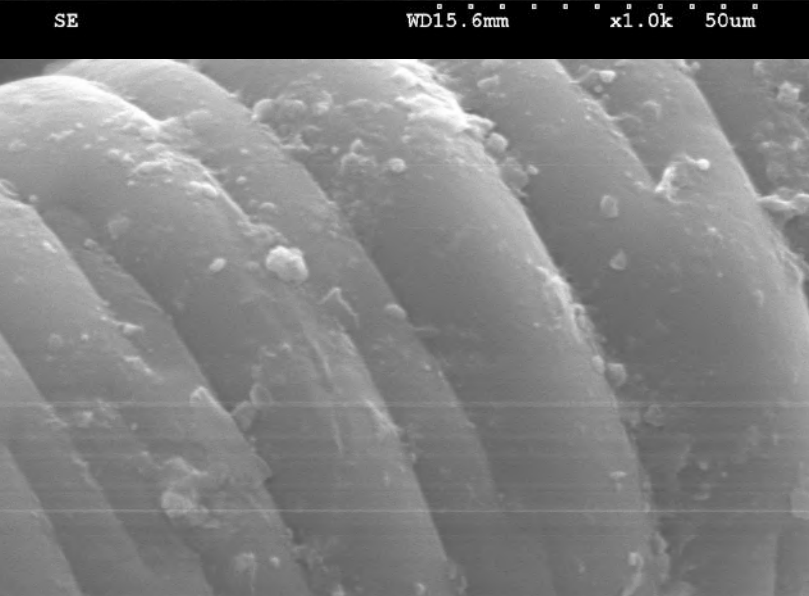
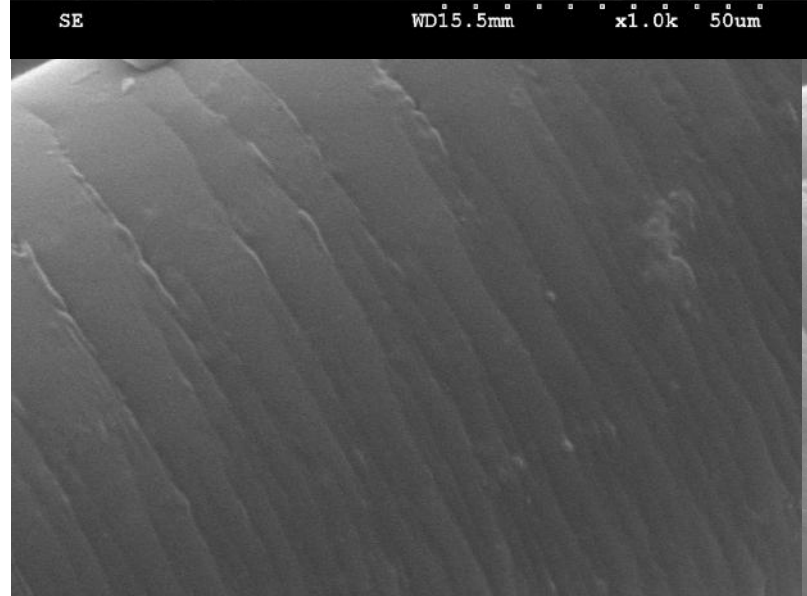
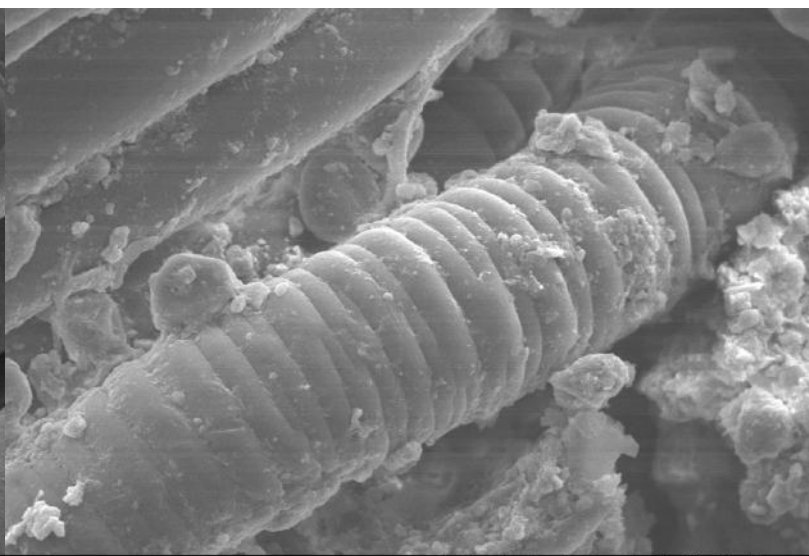
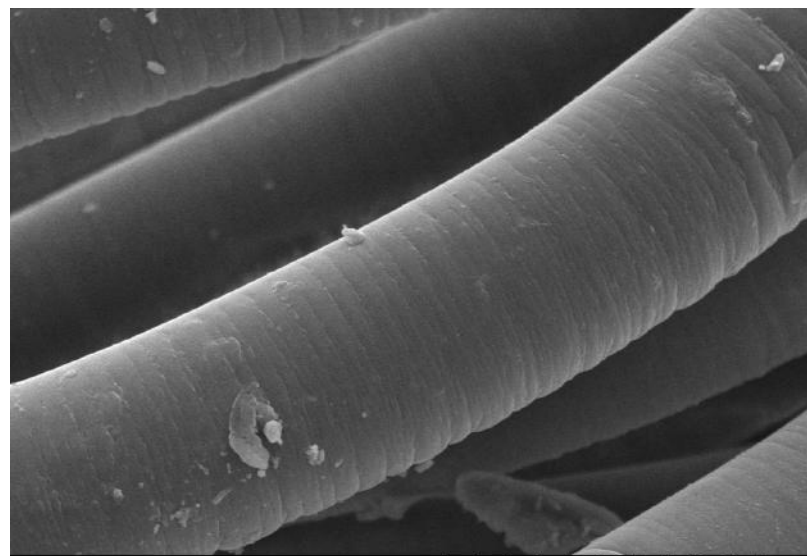
Biodegradation Test Reports

Plastic Resin	Biodegradation	Faster Than Plastic Without BioSphere
<i>PET</i>	<i>210 Days / 27.8% Deli Container</i>	<i>Performing 10X Faster Biodegradation</i>
<i>PET</i>	<i>175 Days / 92.7% Woven Fiber</i>	<i>Performing 81X Faster Biodegradation</i>
<i>PET</i>	<i>39 Days / 14.9% Thread Fiber</i>	<i>Performing 36X Faster Biodegradation</i>
<i>PET</i>	<i>47 Days / 19.6% Bottle</i>	<i>Performing 197X Faster Biodegradation</i>
<i>Olefins PE/PP</i>	<i>18 Days / 13.9% Bags</i>	<i>Performing 50X Faster Biodegradation</i>
<i>LDPE</i>	<i>94 Days / 13.3% Bags</i>	<i>Performing 133X Faster Biodegradation</i>

Biodegradation: PET Fiber

Before Biodegradation

105 Days of Biodegradation



Compare Technologies

Question	BioSphere	Oxo's	BioResins	BioAdditives
<i>Biodegradable in Landfill</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>Some</i>
<i>Biodegradable in Compost</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>Some</i>
<i>Compostable D6400</i>	<i>Poised to Pass</i>	<i>No</i>	<i>Some</i>	<i>No</i>
<i>Fragments if Littered</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>No</i>
<i>UAE Approved</i>	<i>Not at this time</i>	<i>Yes</i>	<i>No</i>	<i>No</i>
<i>Compatible with Recycling</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>Some</i>
<i>ASTM D5511-12</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>No</i>
<i>ASTM D5338-12</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Some</i>
<i>Simulated Landfill</i>	<i>Yes</i>	<i>No</i>	<i>No</i>	<i>No</i>

“Never doubt that a small
group of thoughtful,
committed citizens can change
the world; indeed, it is the
only thing that ever has.”

-Margaret Mead (1901-1978)



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