

**GS POLYMER CONSULTANTS**  
**10378 EASTCHURCH, CHAPEL HILL, NC 27517**  
**PHONES: 919 960 0832 (office); 919 593 2791 (cell)**  
**E-MAIL: grahamswift@aol.com**

**Bio-Tec Environmental LLC Technology for Biodegradable Polymers – EcoPure**

**Objective:**

To assess the technical strength and claims from Bio-Tec of their EcoPure additive technology to convert conventional commodity plastics into biodegradable analogs.

**General Conclusion:**

There is no viable evidence the technology is capable of delivering on the claims that EcoPure additives can convert commodity plastics of all types to completely biodegradable analogs. The claims are as misleading as those made by many others, which uses a similar approach of organic additives to promote biodegradation in commodity plastics. Both approaches have been tried several times before by a number of groups using starch and fatty acids which were found to be unsuccessful and never implemented commercially. The technology of EcoPure is inadequate and claims based on it are unfounded.

**Technical Conclusions:**

- The EcoPure technology claims to promote the biodegradation of commodity plastics which follows in a long line of questionable organic additive technologies. For example: Mobil and Prof. Richard Wool at U. Illinois. None has ever been found to offer anything but a very limited biodegradation (under acceptable biometric testing conditions) which is generally considered due to impurities or incomplete mixing of the additive with the plastic. If extrapolation from this limited data to predict complete biodegradation cannot be substantiated by EcoPure or anyone else, it is highly questionable! A small ratio blending biodegradable additives with plastics only result in the leaching of the additives or, limited plastic breakdown occurs.
- Biodegradation testing of plastics by weight loss or by visual comparison of surface erosion used by EcoPure is not accepted by any reputable authority. These are very antiquated evaluation procedures more suitable for testing resistance to surface attack by microbes. Just to set the benchmark, ASTM and other standards organizations are quite clear in their defining of biodegradation:
  - Gaseous evolutions, carbon dioxide and/or methane, must be measured in appropriate environments so that the degree of conversion

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(biodegradation) of the carbon in the plastic can be accurately assessed under those conditions. This emphasizes that the ultimate level of biodegradation and the rates of biodegradation must be recorded. It is not permissible to extrapolate to time for total biodegradation from limited low levels of biodegradation! Biotech makes such extrapolations!

- In my opinion, the patented technology of EcoPure is grossly overstated in that it is totally lacking in scientific validity and is nothing more than a compilation of simplistic expectations or speculations with some basics of biodegradation chemistry thrown in as camouflage. Limited scientific data from unacceptable testing protocols with much speculation do not or should not be the basis for technology patents. There is no expectation or reason for this patent to stand up in a legal challenge to its authenticity.

**Graham Swift**

**President, GS Polymer Consultants**

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