

Eden Research Laboratory

Date: October 19, 2015

# Update

From: Thomas Poth

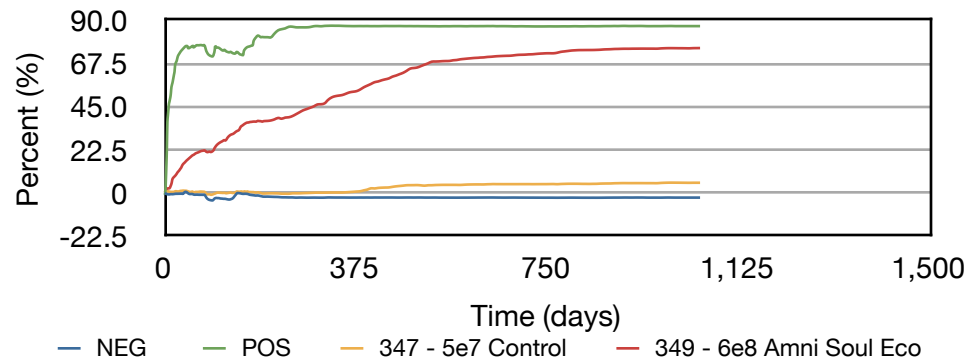
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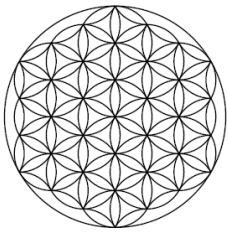
Regarding: Testing under ASTM D5511 of Rhodia PA6.6 ECO Samples (347,349) (1050 Days)

	Inculum	Negative	Positive	347 - 5e7 Control	349 - 6e8 Amni Soul Eco
Cumulative Gas Volume (mL)	3487.8	3015.2	11790.1	5397.0	24483.1
Percent CH <sub>4</sub> (%)	43.0	43.6	43.3	45.1	59.7
Volume CH <sub>4</sub> (mL)	1498.6	1313.9	5099.4	2432.4	14612.0
Mass CH <sub>4</sub> (g)	1.07	0.94	3.64	1.74	10.44
Percent CO <sub>2</sub> (%)	43.0	43.6	43.3	45.0	51.4
Volume CO <sub>2</sub> (mL)	1498.6	1313.9	5099.4	2427.0	12581.2
Mass CO <sub>2</sub> (g)	2.94	2.58	10.02	4.77	24.71
Sample Mass (g)	1,000	10	10	20.0	20
Theoretical Sample Mass (g)	0.0	8.6	4.4	17.1	17.1
Biodegraded Mass (g)	1.61	1.41	5.46	2.60	14.57
Percent Biodegraded (%)		-2.3	87.3	5.8	75.6
* Adjusted Percent Biodegraded (%)		-2.6	100.0	6.7	86.6

\* Outside of the ASTM D5511 method and on the assumption that the positive control (Cellulose) will fully biodegrade, all value have been proportionally adjusted.

## Biodegradation





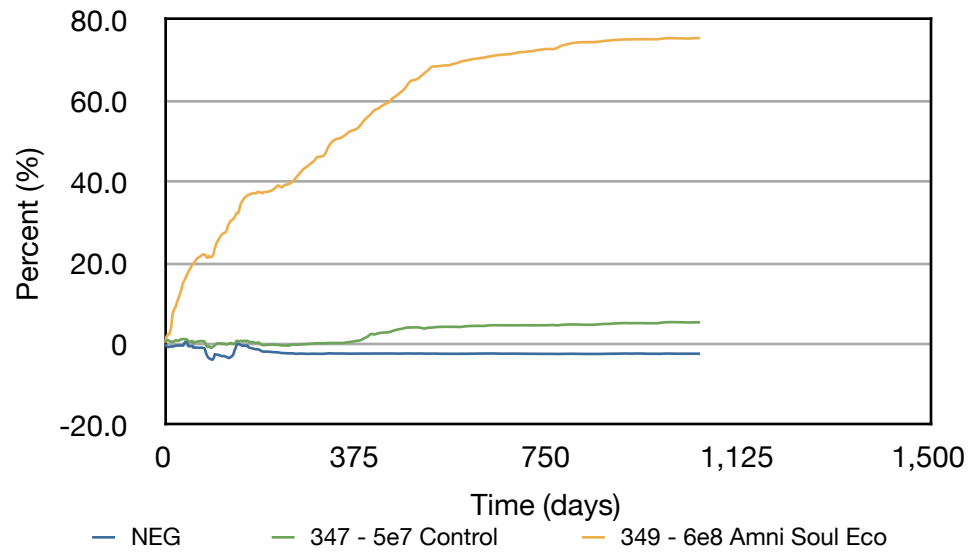
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## Biodegradation



## **Explanatory notes on ASTM D5511 – Standard Method for Determining Anaerobic Biodegradation of Plastic Materials Under High Solids Anaerobic-Digestion Conditions**

### **Short description of the test method:**

This test method is the most widely used for the assessment of anaerobic biodegradability of plastic materials. Basically, the method consists of a lab digester set-up. The sample is exposed to inoculum derived from anaerobic digesters, containing a high concentration of anaerobic methane-producing microorganisms. The volume of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) produced by the biodegradation process are accurately measured, and comparing them with the theoretical volume, based on the carbon content of the material, the percentage of biodegradation over time can then be assessed. This method resembles some conditions in biologically active landfills.

Notes on the data presented in the report:

- Column Inoculum: The results of the inoculum without any sample. Inoculum is the substrate used for the test, containing anaerobic methane-producing microorganisms. This data is used as reference for the calculations.
- Column “Negative”: The results for a sample of a non-biodegradable plastic – Polyethylene
- Column “Positive”: The results for a sample of a biodegradable material – Analytical-Grade Cellulose
- Column “Control”: The results for a sample of dyed fabric made with standard Polyamide 6.6 yarn
- Column “Amni Soul Eco”: The results for a sample of dyed fabric made with Amni Soul Eco® yarn

### **Interpretation of the results**

In the testing report hereby, done by an independent laboratory according to ASTM D-5511 method, a sample of Amni Soul Eco® shows nearly complete biodegradation in approximately 3 years, whereas standard polyamide used as control showed less than 7%. It should be noted that the time for biodegradation in ASTM D5511 tests can vary greatly from one test to another, due to the fact that it undergoes a biological process, which can be influenced by several factors. Therefore, the time span of approximately 3 years for nearly complete biodegradation shown in this report should not be interpreted as a precise time span, but rather as an order of magnitude of “a few years”. Likewise, the standard polyamide sample showing less than 7% biodegradation in 3 years should be interpreted as indication that standard polyamide typically would take a time span of some decades to reach complete biodegradation. As a whole, the results demonstrate significantly enhanced biodegradability of Amni Soul Eco® when compared to standard polyamide.