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LABORATORY REPORT

Advanced
Materials
Center, Inc.

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Client: Red Pod Inc.
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Date: July 8, 2009
Project #: 09P1085 ASTM D 6868
Check#: 2366

Purpose:

Evaluate the compost disintegration of one (1) material per ASTM D-6868, D-6400-04 using a modified ASTM D-5338 @ 58 ± 2 °C by contact with composting material for twelve (12) weeks. Compare the results to the biodegradation rate of a positive control of cellulose.

Start Date: 03/27/09

End Date: 06/27/09

Total Exposure Time: 90 Days

Sample Identification:

- A. Positive Cellulose Control - One (1)
- B. Coated Hot Cup - 22.0 mil - Three (3)

Source:

Red Pod Inc.

Conclusions:

In our opinion, based on the overall weight loss and disintegration, Sample B (Coated Cup) has fulfilled the requirements presented in ASTM D 6868. ASTM D-6868 and D-6400-04 requirements include the samples being tested for twelve (12) weeks and reaching a minimum of 90% weight loss.

Results:

The test samples % weight loss of those recovered (Refer to Table I):

		<u>% Weight Loss</u>
Sample A1	Positive Cellulose Control - One (1)	100.00
Sample B1	Coated Hot Cup	100.00
Sample B2	Coated Hot Cup	89.40
Sample B3	Coated Hot Cup	100.00

Discussion:

The evaluation of the samples were run per ASTM D 6868, D 6400-04 using a modified ASTM D-5338 @ 58 ± 2 °C by contact with composting material for ninety (90) days. ASTM D 6868 specifically looks at the disintegration properties (% Weight Loss) of the exposed materials. ASTM D 6868 is not performed to calculate the % carbon to carbon dioxide conversion. The amount of material used in D 6868 also differs from that used in D 5338. Along with the whole material, grounded material is added to prepare the compost for the OECD 208 Plant Toxicity Test. The overload of material would affect the calculated CO₂ values which are found in D 5338.

The first flask (B1) containing the coated cup sample included 10% by dry weight of the plate sample of which 9% was ground material and 1% was solid material. The amount of dry compost added (90%) is based on both the dry weight of the ground material and solid material. This value changes for each sample due to the differences in initial weights. Each additional flask containing the coated cup samples (B2-B3) had 1% solid sample and 99% dry compost. The flask containing the cellulose control held 1.0% solid material and 99% dry compost. Each material is ground using a Wiley Mini Mill with a 40 mm mesh chamber manufactured by Thomas Scientific.

Composting material was purchased from Monterey Mushrooms Inc in Princeton, IL. The composting material had a Carbon : Nitrogen ratio of 13.5:1 which was within the specifications for this test. The pH of the compost material was 7.3 with a total dry solids percentage of 50% when dried at 105°C until constant weight was achieved and was within the limits of 50%-55%. The volatile solids had a dry matter content of 28% which was under the 70% allowed. The compost material in each flask was stirred weekly and deionized water added when needed to keep the compost material moist.

The precut circles were prepared using a 1.6" diameter dye cutter. There were six (6) circles (dry) placed into the Coated Cup flasks for exposure. The cups were not moistened directly when introduced to the compost. The sample materials became moist when water was added to the compost. A 2.0 mm sieve was used to separate the compost from any remaining sample material.

Table I represents the initial and final weights of all the samples tested. The initial weights are the dry weights of the cups before added to the compost medium.

Figure I depicts the average total weight loss of the samples compared to that of the positive cellulose control. The total weight loss was calculated by subtracting the final weights (of the cups and cellulose) from the corresponding initial weights. This gives a weight loss value in grams, which is then converted to percent.

The positive cellulose control (Sample A1) had an average total of **(100.00%)** compost disintegration. None of the cellulose material could be found in the composting material.

Sample B1 - B3 had an average total of **(96.47%)** compost disintegration. A small amount of Cup sample from flask 2 was found in the compost medium after the 90 day compost exposure period.

In our opinion, Sample B fully meets the requirements of ASTM D 6868. The Coated Hot Cup surpassed the 90% weight loss requirement expressed in ASTM D 6400-04 in the ninety (90) day compost exposure.

ASTM D-6868 Aerobic Biodegradation - 90 Day Compost Exposure

Client: Red Pod Inc.

Phase I

Started: 03/27/09

Finished: 06/27/09

Total: 90 Days

Table 1 - Post 90 Day Compost Exposure Results

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Sample Reference	Sample Size	Initial Weight (1%) (g)	Final Weight (g)	90 Day % Weight Loss	% Ash As Received	Flask Number
Positive Cellulose Control	8 Cut Circles	0.6138	0.0000	100.00	0.00	1
Coated Hot Cup - 22.0 mil	6 Cut Circles	2.9126	0.0000	100.00	0.34	2
Coated Hot Cup - 22.0 mil	6 Cut Circles	2.7825	0.2950	89.40	0.34	3
Coated Hot Cup - 22.0 mil	6 Cut Circles	3.2569	0.0000	100.00	0.34	4

**Figure I: ASTM D 6868 - 90 Day Compost Exposure
Red Pod Inc. - Project #09P1085 - Coated Hot Cup
% Weight Loss**

