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Organic Waste Systems

Proposed, Revised Green Guides, 16 CFR Part 260, Project No. P954501

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O.W.S. Inc. (OWS) applauds the FTC's publication of the *Green Guides* and the desire of the FTC to update the guides to reflect current situations and scientific knowledge. However, OWS believes the FTC may, in the name of protecting the public from deceptive claims, be missing an opportunity to promote the development and marketing of environmentally friendly products, by depriving material developers and manufacturers of tools for assessing the validity of claims they might wish to make. After reviewing the *Proposed Revisions to the Green Guides*, OWS would like to comment on several points in the analysis and proposed guides.

1. The scientific merit of the ASTM standards

The FTC analysis states on p. 77 the following:

> "Three commenters suggested that the Guides reference two laboratory protocols adopted by ASTM: (1) Standard specification D 6400 for compostable plastics; and (2) Standard specification D 6868 for biodegradable plastics used as coatings. The commenters, however, did not explain why these protocols would substantiate compostable claims and thereby meet consumers' expectations about compostable products. Based upon a review of the protocols' methodology, the Commission does not propose referencing these protocols in the Guides."

Both ASTM D6400 and D6868 address the significant issues involved in assessing the compostability of a product. Compostability encompasses four factors - biodegradability, disintegration, ecotoxicity, and heavy metals content. Biodegradability shows quantitatively the inherent nature of the material to be consumed by microorganisms. Biodegradability is different from disintegration. Biodegradability protects the environment by showing that the material will not accumulate over time when the compost is applied to soil. Compost as a soil amendment is typically applied once per year. ASTM D6400 conservatively requires that the biodegradation be achieved within six months, which is one-half of the one year allowed by the proposed *Green Guides*. This time frame should not be confused with the processing duration in a composting facility. That time frame is addressed by the disintegration test.

Disintegration, as opposed to biodegradation, measures whether the material breaks down and falls apart under typical commercial composting conditions. The duration of the test stipulates that 90% of the material must pass a 2-mm sieve after three months of pilot-scale composting. Disintegration protects the compost plant operator and compost end user. Operators cannot sell compost containing visible fragments of the subject material in the compost. Likewise, compost users would not want visible fragments in the compost they buy.

Ecotoxicity testing determines whether the material after composting shows any inhibition on plant growth. Metals testing shows whether the composted product would contribute to the addition of heavy metals to the soil at unacceptable levels. Ecotoxicity and metals testing protect the environment, compost plant operators, and compost end users. The standards protect the environment by preventing the application of deleterious material to the soil. The standards protect compost plant operators from the liability of inadvertently selling deleterious materials.

Finally, the standards protect compost end users by preventing them from applying compost that might be harmful to their plants.

The suite of tests specified in both ASTM D6400 and D6868 addresses these issues. No one test provides all the information needed. However, taken together, the tests form a specification which, if met, eliminates any danger in allowing the compostable product into the compost waste stream. For example, a product such as the *Hefty* trash bags of the early 1990's would not pass ASTM D6400.

2. The origin of ASTM D6400 and D6868

The FTC analysis states on p. 77 the following:

> "ASTM created D 6400 and D 6868 in response to manufacturers' increased production of plant-based plastic resins."

While it is true that manufacturers of plant-based plastic resins took part in the development of these specifications, it is an incomplete statement. Representatives from manufacturers of petroleum-based biodegradable materials, manufacturers of consumer products, independent testing laboratories, and university researchers all participated in the development of these consensus standards. The standards represent the accumulation of significant scientific knowledge. The conclusions reached in the development of these standards at ASTM were also reached at CEN, the European Committee for Standardization, and ISO, the International Standards Organization.

Furthermore, it is important to point out that these specifications are used for other materials than just plastics products. Manufacturers of paper and coated-paper products, as well as producers of other natural-based materials, also rely on these standards for establishing the compostability of their products.

3. The purpose of test article physical size in ASTM D5338

The FTC analysis states on p. 78 the following:

> "Moreover, the laboratory procedures ignore "wide variation" in actual composting facility operations, simulating instead "optimum conditions."[224]
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> [224] See ASTM D 5338 – 98 (Reapproved 2003)...One example of such an optimum condition is the testing of only a small piece of the subject material – a two centimeter scrap – rather than full-size plastic feedstock waste items."

This analysis misunderstands the purpose of the ASTM D5338 Controlled Composting standard test method. As discussed in point 1 above, the purpose of the biodegradation test is determining the *inherent nature* of the material to biodegrade. That is, can the organic molecules of the material be consumed by microorganisms to the extent that the organic carbon contained in the material is converted into carbon dioxide and water. The test is not intended to determine the ability of a product to break apart in a composting process. Therefore, the physical size of the material sample tested in D5338 is irrelevant.

Disintegration of full-sized plastic items is determined by ISO 16929, Plastics - *Determination of the degree of disintegration of plastic materials under defined composting conditions in a*

pilot-scale test. In that test, full-sized product items are subjected to conditions typical for commercial composting. That is why the suite of tests specified in ASTM D6400 and D6868, which includes D5338 but also other tests, is needed to determine the compostability of a product.

4. **Simulation of "optimum" conditions**

The FTC analysis in note 224 (p. 77) references the following language from ASTM D5338, *Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions*:

> "224 See ASTM D 5338 – 98 (Reapproved 2003) at § 5.2 ("Because there is a wide variation in the construction and operation of composting systems and because regulatory requirements for composting systems vary, this procedure is not intended to simulate the environment of any particular composting system. However, it is expected to resemble the environment of a composting process operated under optimum conditions.")"

The analysis then draws the following conclusion:

> "Moreover, the laboratory procedures ignore 'wide variation' in actual composting facility operations, simulating instead 'optimum conditions.'"

This conclusion is a misunderstanding of the context of the statement. Every commercial composting process has its own particular features. However, all commercial composting systems must achieve certain conditions in order for the composting process to be successful. If any commercial compost plant does not operate at close to optimal conditions, then it will produce a poor-quality compost product, regardless of feedstock. The method was intended to simulate a well-run, properly operating compost system. The sentence immediately following the ASTM D5338 section referenced provides the perspective:

> "More specifically, the procedure is intended to create a standard laboratory environment that will permit a rapid and reproducible determination of the aerobic biodegradability under controlled composting conditions."

Full-scale tests are costly and difficult to accomplish. The standard test method provides a reliable, proven technique for predicting the biodegradability of materials under proper composting conditions. The term "optimal" was meant convey the idea that the test would not simulate a poorly run commercial system.

5. Conservative nature of tests specified in ASTM D6400 and D6868

The FTC analysis states on pp. 78-79 the following:

> "It is unclear whether these "optimum conditions" reflect real world conditions... Therefore, it is doubtful that there are typical large-scale composting practices consistent with the ASTM protocols..."

In June 1991, ASTM's Institute for Standards Research (ISR) launched the "Degradable Polymeric Materials Program," which developed a comprehensive understanding of the performance of biodegradable plastic materials in commercial waste treatment processes. The program investigated and compared materials subjected to composting tests at three levels:

laboratory bench scale, pilot scale, and full scale. The major concern at the start of the project was that the "optimal" conditions of the tests might not accurately predict the performance of materials in real-world composting processes. The conclusion of the five-year project was, however, that the laboratory-scale ASTM D5338 Controlled Composting test gave comparable results to the results obtained in the full-scale tests. Likewise, the pilot-scale tests obtained results that were consistent with the results of the full-scale tests.

The final report of the program stated the following:

> "Comparing the results obtained for the same material at each scale shows that for all materials compared, without exception, the degradation results obtained in a higher-level test equaled or exceeded those obtained in a lower-level test. This means, for example, that the laboratory-scale ASTM D 5338 was more conservative than the pilot-scale P&G test which in turn was more conservative than the full-scale RECOMP II test. This observation has important ramifications with regard to environmental claims based upon laboratory and pilot tests. In order to provide valid and useful information, a full-scale test must be very well planned and executed, while the logistics of conducting a test at that scale can be extremely difficult. Furthermore, the full-scale information cannot stand alone, but must be supported by tier 2 results. On the other hand, the full-scale test might not provide any further knowledge on the performance of a material than the laboratory and pilot tests together developed. The full-scale tests can, however, provide verification of results obtained at tier 2 (*Reports on the Compostability Testing of Degradable Polymeric Materials*, available at http://www.astm.org/BOOKSTORE/PUBS/262.htm)."

It is also important to note that ASTM D6400 and D6868 differentiate between *biodegradable* and merely *degradable*. Tests conducted in full-scale composting plants can only measure weight loss and disintegration. Such tests cannot measure mineralization, the conversion of the organic carbon of the product into carbon dioxide and water. ASTM D5338 accomplishes this purpose, and shows the inherent nature of the material to be consumed by microorganisms.

As demonstrated in the ISR work, the tests called for in the specifications D6400 and D6868 provide a conservative assessment of a product's ability to be satisfactorily composted in real-world, commercial composting plants. These specifications provide material producers with a workable, reliable means to establish a basis for a potential claim regarding compostability, and therefore constitutes a valuable asset in the *Green Guides* and should be included.

6. **Compost plant operations**

The FTC analysis states on pp. 78 the following:

> "There are no comprehensive, mandatory operating requirements for large-scale composting facilities."

While there exist no federally mandated requirements for the operation of compost plants treating municipal solid waste (MSW), except for those plants that treat biosolids, almost every state has requirements for the composting of MSW. More importantly, however, is the fact that the microbial ecology of composting environments require that compost plants be operated within certain temperature and aeration boundaries in order to achieve successful conversion of organic matter into humic materials. If the plant is operated in such a way that inherently biodegradable products will not compost, then other accepted organic feedstocks will also not compost and the plant will produce unusable, unsalable product. The microbial ecology provides a self-limiting

system, in that in order for good compost to be produced, regardless of the feedstock, the system must be operated in such a way that inherently biodegradable products will also compost.

7. **Philosophy of standards**

It is very important to prevent deceptive marketing claims for biodegradable or compostable products. However, if the bar is set too high, then the motivation for innovation and development of products truly beneficial to the environment will be destroyed. In regards to the Mobil *Hefty* trash bag case of the early 1990s, then Minnesota Attorney General Hubert Humphrey III issued the following statement:

> "One of the most exciting trends of the past year is that consumers want to buy products that are good for the environment (Press Release, State of Minnesota Office of the Attorney General, June 12, 1990)."

While Attorney General Humphrey went on to emphasize the need for preventing deceptive claims, he did correctly point out the consumers desire environmental choice in the products they purchase. If the manufacturer of a compostable material or the producer of products made from that material have no reasonable avenue to test claims, such as through the ASTM D6400 and D6868 specifications, then advancement of earth-friendly materials will be stifled or killed, and consumers will be left with no alternatives but polyolefin products that will last well past the consumers' lifetimes.

Thank you for this opportunity to comment on the proposed revisions to the *Green Guides*. The ASTM standards provide material developers and product manufacturers clear and effective means to assess the compostability of their materials and products, and should be referenced in the *Green Guides*. This action will in turn provide consumers with environmentally preferable products for them to choose.

Sincerely,

Richard Tillinger
O.W.S. Inc.