



Compostable Products, Certification & Testing

March 2023



A science-driven non-profit formed in 1999 to support a shift to the circular economy by promoting the production, use, and appropriate end of lives for materials and products that are designed to fully biodegrade in specific biologically active environments.



Certification

Provide technically and scientifically credible certifications for materials that biodegrade in biologically active environments.



Education

Drive awareness and understanding of composting systems that include certified products, in the context of the circular economy and diversion of organics from landfill.



Advocacy

Expand opportunities and access for systems that accept and process certified products in the context of zero waste.



Compostable Products Certification

Requirements for BPI Certification



ASTM INTERNATIONAL

D6400 and D6868 Compostability Standards

1. **Disintegration (90% in 84 days)** – finished product must physically and visually break down
2. **Biodegradation (90% in 180 Days)** – organic carbon must be converted to CO₂
3. **No Adverse Impacts** – product and ingredients tested for plant toxicity and heavy metals



Additional Requirements (PFAS, Connection to Food, Labeling)

1. **Fluorinated Chemicals (PFAS)** – As of Jan 1, 2020 all BPI-Certified items must be free of intentionally added fluorinated chemicals and below 100 ppm total organic fluorine.
2. **Eligibility Criteria** – Connection to food scraps, can't be a better fit for recycling, no disassembly.
3. **On-Item & On-Package Labeling** – All certified items and packaging must display the BPI Certification Mark.



Compostables Field Testing

Field Validation: Roadmap, Current Data, Composter Guides

- A BPI/BioCycle Stakeholder Workshop in early 2021
 - Addressed barriers
 - Desired future state with consistent acceptability criteria
 - Common approach to field testing
- This led to a 2021 BPI report on public data showing 1,000+ products that passed robust field tests, most in as little as 49 days,
 - Meaning ASTM tests are sufficient indicators of real-world results in many cases.
- Also in 2021, USCC published two documents to support:
 - "Compostable Products: A Primer For Compost Manufacturers"
 - "Compost Manufacturers' Decision Guide to Accepting or Rejecting Compostable Products"



Overview

In reviewing publicly available field testing data, it is clear that a significant amount of work has already been done. A few active organizations have conducted thousands of tests, funded by over a hundred companies looking to better understand how certified items break down in the real world. This establishes a firm foundation to work from.

The majority of categories that BPI certifies today are represented in this data, showing some initial indication that the lab testing called for by ASTM/EN/ISO standards may be sufficiently conservative for determining whether or not items will break down in full scale composting conditions, as was the original intent of the standards. This includes items made from potentially challenging materials like crystallized PLA (CPLA), with high crystallinity to withstand heat.

The data re-published here, however, does not include failed field tests or information on test conditions beyond process time. Operating conditions such as temperature, moisture, C:N ratio, and pH were not reported. As a result, the existing data alone does not provide a complete picture. All of these variables are important for understanding whether the field test was representative. A controlled field test is required to validate that a specific test correlates to full-scale composting processes.

Findings

The data provided here demonstrate that certified products have been shown to successfully disintegrate in existing composting processes, despite not reflecting documented controls for these processes. Most of the products successfully passed 49-day field tests, including 16 categories of bioplastics and coated paper products. These products represent the majority of physical forms and material composition of certified products currently in the market today. Molded fiber products are a notable exception to this and are not represented in the data.

Field Validation: ASTM Protocol

- In early 2022, BPI registered an ASTM work item to develop a consensus-based, independent, standardized field test method.
 - 1) Working group has 41 participants from product/material producers, composters, US/Canada compost associations, testing labs, universities, etc.
 - 2) Utilizes CFTP protocol as basic mechanics of test, adjusted to the format of ASTM test methods
 - 3) Adds "defined operating conditions" to attempt to get more repeatable and comparable results, using CREF's Composter Operator Training Course (COTC) and Composting Handbook (2022 Rynk, et al).
 - 4) Assesses abbreviated timeframe (45-49 days), as well as compost stability (Solvita 5 or greater), as end points for assessing disintegration.
- Pilot tests with Closed Loop Partners has begun at 11 facilities that represent all composting methods, that will assess the draft test method and suggest any needed adjustments.

Field Validation Conclusions

1. Confidence in the rate of break down in commercial composting facilities is one of the top issues for our industry to address.
2. Overs testing is an important first step to separate this topic from the issue of contamination.
3. Field validation of products by type/category, rather than field testing as a certification requirement on individual products, is the best path forward for BPI to work with composters to build confidence in certified compostable products.



Product Labelling

Labelling Research Project Information

Project Leaders



Project Goal

To identify those design and labeling techniques that best **improve** the **diversion** of food-contact compostable packaging to the **correct material stream**.

Survey Design + Data Analytics



Primary Audiences for the Data

- 1) **Manufacturers & Brands** – the organizations making labeling decisions
- 2) **Regulatory Audiences** – the decision makers and influencers working on labeling bills

Labelling Research Project Information

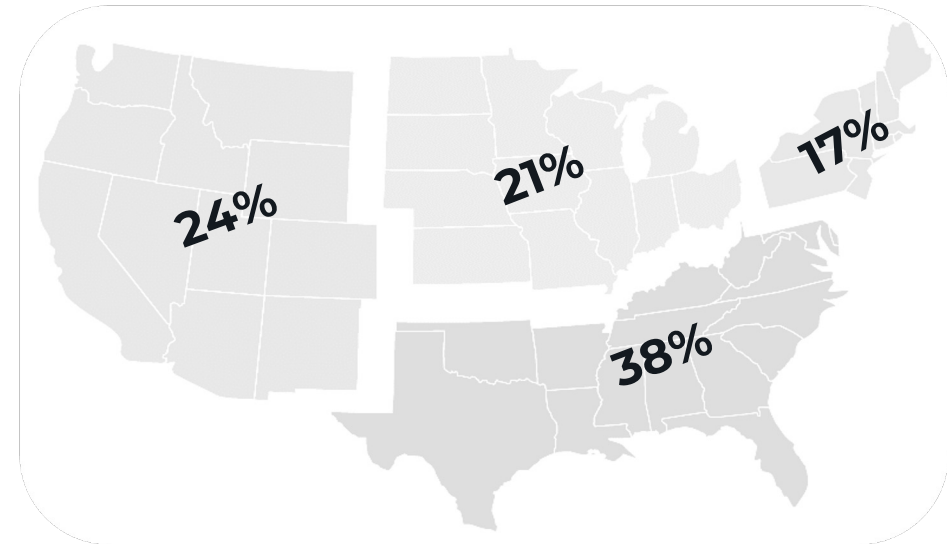
Package Testing

We tested 156 designs across 10 categories of compostable packaging



Testing Audience

We surveyed 2,700+ respondents in line with the US general population



Results & Key Takeaways

- 1 **Clear Labelling:** Across compostable packaging categories, use of the **BPI Certification Mark, color (tint, print, material coloring), a larger “compostable” call-out** consistently make it easier to identify an item as compostable.
- 2 **Look-a-like Elements:** Use of words like **“biodegradable”** together with colors and design elements common in compostable product labeling are generating confusion among consumers, leading them to misidentify non-compostable products as compostable.
- 3 **“More is more”** when it comes to effective on-item labeling. Across all categories tested, consumers showed a preference for more than one design and labeling element on compostable packaging and products.

USCC & BPI continue to collaborate on labelling principles.

Testing Results Example

Compared to the minimum effort of including a small “Compostable”, using larger font, including a stripe and the BPI mark, and using a natural color cup increases the likelihood that a consumer identifies the paper cup on the left as compostable by **34%**

Large “Compostable”
Stripe
BPI Mark
Natural Color



Small “Compostable”
No stripe
No BPI Mark
White Cup



Thank You!

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Field Validation vs. Field Testing in Certification

What is the role of field testing in certification?

- Field testing is well-suited as an indicator to support acceptance of certified products, but challenges remain as a requirement in certification, due to scalability and repeatability/reproducibility of field testing.
- Even with a standardized field test, there will likely be significant variation in conditions and techniques, making it challenging to be definitive whether a failed field test is related to the facility or test item.
- In 2023, BPI plans to partner with the US and Canadian Compost Councils, along with CREF and CFTP, to get agreement on annual field tests and reports needed to build trust between our respective stakeholders.
- The focus will be on testing types of products and materials, rather than approvals of specific brands/items.

