



DESIGNING FOR COMPOSTABILITY IN CANADA

Can I compost that? Certification and Acceptance

2015

Contents

3	Introduction
4	What Dictates Acceptance for Products and Packaging?
9	Conclusion
10	More Resources

The National Zero Waste Council would like to thank its Product Design and Packaging Working Group for its contributions to this series: Alan Blake, Executive Director, PAC NEXT (Co-lead); Susanna Carson, CEO, BSI Biodegradable Solutions (Co-lead); Allen Jensen, Assistant Project Engineer, Solid Waste Services, Metro Vancouver; Laurie Lewis, Diversion Planning Coordinator, Halifax Regional Municipality; Colin Isaacs, CIAL Group; Julian Radlein, SymbiAudit Inc; Isaul Lopez, Sales and Business Development - Biopolymers, BASF; and Jeanette Hanna, Market Development - Biopolymers, BASF. Thanks also to Emily McGill, who prepared the documents in this series.

Photo credit: BSIbio

Introduction

More products and packaging on the shelf today are called *compostable*, and or *biodegradable*, than ever before. Canada's National Zero Waste Council has identified compostable materials as both an innovation and a source of confusion for producers and consumers, and is exploring this topic through the Designing for Compostability in Canada publication series.

Why is design for composting so attractive? Composting is a type of *organics recycling* that takes *organic material* and transforms it into usable compost, a soil amendment that provides essential benefits¹ to farms, gardens, and landscapes.

As authorities become more discriminating in the management of solid waste, designers and manufacturers are looking for products and material types that divert waste from landfill and incineration. Composting closes the loop on biological waste, and promotes the new vision of a zero waste circular economy where end products can be reused indefinitely.

Although composting has traditionally been used to process yard debris, farming by-products and food scraps only, the advent of commercial composting systems has enabled packaging and products made of specialized materials to be composted. With the growth of this type of large-scale composting across Canada especially - 344 facilities existing as of 1998² - new products and packaging made from compostable plastics and natural materials are making their way onto the shelf and into our organics bins.

For innovative designers, composting is seen as an alternative pathway for a product or package life cycle. This is especially useful for items that come into contact with food since food-soiled items contaminate recycling streams, becoming difficult or impossible to recycle mechanically.

The Designing for Compostability in Canada series endeavors to answer some of the core questions on what, when and where we should be designing for compostability in Canada. This report covers the importance of certifying products, the difference between certification and facility acceptance, and the best practices to apply when designing for compostability.

This is meant for product/packaging designers, purchasers, brand owners and the general public to understand what is behind compostability claims, and what steps are essential when considering design for compostability. Although the information is written from a Canadian perspective, it may apply elsewhere.

Complimentary publications in the Design for Compostability in Canada series include *Can I Compost That? A Materials Acceptance Guide*, and a terminology package (including commonly confused definitions) which includes two decision trees on "Material Recovery options in a Circular Economy", and "Can I Compost That Food Packaging."

1 Compost Council of Canada, (n.d.) Successful Composting; The Benefits of Compost (PDF). Online at: www.compost.org/pdf/sheet_7.PDF

2 Antler, Susan. (2012). Compost Grows Stronger. *Municipal World, May 2012 edition*. Online at: http://www.compost.org/English/state_industry.htm

Key Terms

Organics: Natural materials; food scraps, yard debris, grass clippings, paper (and food soiled paper), etc.

Organics bin: The system for carrying organics from a home or business to a compost facility.

Organics recycling: Also known as composting.

Compostable³: Material that degrades by biological processes during composting to yield carbon dioxide, water, inorganic compounds and biomass at a rate consistent with known compostable materials, and leaves no visible or toxic residues.

Biodegradable⁴: Any material that degrades by biological processes under the right conditions, without any defined time limit or end product. Biodegradation can occur in many environments: compost, anaerobic digestion, soil, marine or freshwater. This term does not indicate anything about acceptance in organics bin programs.

Circular economy⁵: A circular economy is an alternative to a traditional *linear* economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

Closed-loop: As required in a circular economy, products and materials that remain useful resources by maintaining a make use remake reuse cycle, as opposed to a conventional *linear* pathway of make use dispose.

What Dictates Acceptance for Products and Packaging?

Large, centralized compost facilities that provide an enhanced composting environment for yard and food waste are becoming increasingly common in Canadian cities⁶. Together with organics bin programs, homes and businesses can divert their *organics* from landfills. The potential for waste diversion through composting is significant as residential waste alone is estimated to have up to 40% organics⁷.

These enhanced composting environments allow for a new range of products and packaging made from compostable materials. For a product or package to be accepted in the organics bin, it has to be accepted by the compost facility serving that region. The graphic below shows the simplest situation of this.

Path to Acceptance in Organics Bins



Processing capabilities and feedstock can vary greatly among compost facilities. This variety in processing means that some compostable materials will not be accepted at some facilities, even if the item is compostable under ideal conditions.

3 ISO 170-88:2008(E), 2008. Specifications for compostable plastics.

4 Vert, M. et al. (2012). Terminology for biorelated polymers and applications (IUPAC Recommendations 2012). *Pure and Applied Chemistry*, 84(2), 377-410.

5 WRAP UK. (2015). WRAP and the Circular Economy. Online at: <http://www.wrap.org.uk/content/wrap-and-circular-economy>

6 BioCycle, 2012. *Composting Organics in Canada*. Vol 53:10, p. 27

7 Environment Canada, 2013. *Technical Document on Municipal Solid Waste Organics Processing*.

Certifying compostable products and packaging is an attempt to clarify and benchmark what is and is not compostable, for both consumers and compost facility operators alike. The test for composting certification aims to verify whether a given product is capable of composting within a reasonable (up to six month), time frame⁸. The test is conducted under controlled composting conditions that are meant to simulate real-world composting conditions at facilities, although they do not always match up, meaning a product can be certified compostable though it may not compost quickly enough in a given facility.

This document provides an overview of the official requirements for certification in Canada, and the unofficial requirements for commercial compost facility acceptance. It is meant to inform businesspeople, product purchasers, manufacturers, and the public about the difference between certification and acceptance. Above all, it stresses the importance of facility acceptance in achieving compostable product solutions.

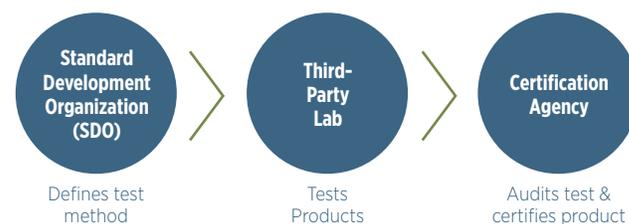
How does a purchaser or product designer improve chances of acceptance?

The point of implementing compostable products and packaging is that they will be composted after use, diverting these materials from dead-end disposal pathways such as landfill and incineration. If they do not get composted post use, then the implementation has not succeeded. It's critical for designers and purchasers to know what will enhance a product's compostability, namely: certification, facility acceptance, and acceptance in regional organics bin programs.

Compostability Certification

Certification is a two- or three-stage process where a product or package is tested by a third-party laboratory, according to methods outlined by a recognized standards body. Once tested and successful, a certifying body allows their certification mark to be used on the product. Products and packaging that are made from all natural materials may be exempt from certification, however, it is still crucial to determine facility acceptance for these materials.

Path to Compostability Certification



Criteria for compostability certification in Canada

In Canada, the *Bureau de Normalisation du Québec (BNQ)* defines the test method for compostability under their national standard CAN/BNQ 0017-088. For a product to be certified compostable, the third-party testing must show, generally:

- disintegration during composting of at least 90% within 84 days
- biodegradation of at least 90% within 180 days
- safe biodegradation in 180 days or less, leaving no visible or toxic residues
- no negative effects on the composting process and facility, and
- no negative effects on the quality of the resulting compost.

⁸ 90% degradation within 84 days, and up to 180 days for ultimate degradation. CAN/BNQ 0017-088.

Ensuring there are no negative impacts on the quality of the end compost includes limits on trace elements and minerals.

This definition is based on the International Standards Organization’s standard ISO 17088: Specifications for Compostable Plastics, and is comparable to other national standards for compostability. The certification criteria for the BNQ are also the same criteria as Standard ISO 17088.

This ISO standard has been adopted by the Canadian Standard Development Committee as a National Standard of Canada, CAN/BNQ 0017-088. The Canadian standard also refers to the other major standards used in North America and developed by the American Society for Testing and Materials, namely ASTM D6868 and ASTM D6400.

Compostability testing is the first step in ensuring a material or product is capable of composting in an enhanced (industrial) composting process, at a rate similar to natural materials that are commonly considered to be compostable such as leaves.

Certification comes with a certification mark. This is essential to identify certified compostable products, although it is not always easily visible on a product or package. The most common certifications in use in Canada are the BNQ’s “compostable.info” and the Biodegradable Products Institute (BPI):



www.compostable.info



www.bpiworld.org

The compostable mark with the maple leaf indicates the Canadian program for certifying compostable products, and the BPI mark is for the US certification program. These certification marks don’t guarantee facility and organics bin acceptance, but they are an essential step, and many facilities require certification of compostability in their acceptance criteria.

Which products are certified?

The BNQ has a list of certified compostable products on its website⁹, and the BPI also hosts a product catalogue online¹⁰. The BPI also provides a useful “decision tree” for product designers to decide whether the product they’re designing is eligible for certification¹¹.

Compost Facility Acceptance

Compost facilities can be thought of as production facilities. Their end product is compost and they usually generate revenue in two ways:

1. Charging fees for organic waste disposal and
2. Selling compost, a valuable soil amendment.¹²

Facilities must balance what they accept as feedstock with creating a high quality end product. In addition to maintaining high quality, there are different grades of compost which demand different inputs and are used for different applications such as soil remediation, landscaping and agriculture.

⁹ BNQ List of Certified Products, Website, <http://compostable.info/certified.htm>

¹⁰ BPI Certified Product Catalogue, Website, <http://products.bpiworld.org/>

¹¹ BPI Decision Tree for Certification, Website, <http://www.bpiworld.org/decide>

¹² Compost Council of Canada, n.d., 10 Reasons to Love Compost, Online: http://www.compost.org/English/10_REASONS.htm

In the case of organic agriculture, certified organic farms are restricted to using certified organic compost on their fields. A compost facility that wishes to become certified organic cannot currently accept modern compostable plastics in their feedstock. If they do take compostable products & packaging made from compostable plastics, their end compost cannot be certified as organic under the current organic regulations¹³.

Criteria for compost facility acceptance in Canada

Compared to the rigorous process required for compostable certification, most compost facilities in Canada do not have a precise set of requirements for accepted materials. Generally, facilities will accept products that:

- do not disrupt the facility's operations
- do not hinder the degradation of other natural materials
- are easily recognizable as compostable: i.e. have compostable certification marks
- will disappear by the end of the compost process, meaning:
 - not be visible to the customer's eye
 - not leave behind sharp material¹⁴
- are related to food; accepting them will increase organics diversion.

The operating conditions of a specific compost facility will influence how easily compostable products and packaging degrade at that facility. The major factors that affect product and packaging compostability are temperature, moisture, oxygen level and duration under these conditions. These vary widely between facilities, and studies are currently being undertaken in Canada and the United States to determine the real-world disintegration rates of certified compostable products and materials under various conditions.

In essence, compost facility operations are high-volume, fast, variable, complex to manage, and are designed to successfully produce compost in a range of conditions. Since compostability certification is a low-volume, highly controlled and monitored process, the results of certification will not always match what specific facilities can manage and accept.

Organics Bin Acceptance

Whether a product or package is accepted in a given organics bin is dictated by two factors:

1. Local facility acceptance of the product/package. This is the crucial factor which has to be in place for any organics bin to accept certified compostable products and packaging.
2. Origin of organics bin; either from residential, business, industry, or public spaces/events. The origin of an organics bin impacts how clean and how predictable the organic waste stream is. Even facilities which accept certified compostable products and packaging may have different levels of acceptance for a commercial or workplace stream than a residential stream.

¹³ Canadian General Standards Board, 2011. *Organic Production Systems Permitted Substances Lists: Composting feedstocks*. p. 5

¹⁴ Sharp materials, or 'sharps', are defined as "any foreign matter over a 3 mm dimension that may cause damage or injury to humans and animals during or resulting from its intended use". Canadian Council of Ministers of the Environment, 2005. *Compost Quality Standards*.

For designers and purchasers planning a closed-loop compostable solution, it's important to note where the product or package is most likely to be disposed of, and pay attention to its likelihood of being composted at that location. If it's unlikely to be composted, it may be time to rethink the design.

Criteria for organics bin acceptance in Canada

Institutional, commercial and industrial business disposal bins are usually collected along with those from other businesses. When this is the case, it is difficult to reassure a facility that the incoming food waste will not be contaminated with non-compostable products.

Special arrangements can be made by businesses, special events, and dedicated venues, so that a compost facility can be assured that the incoming organic materials will have only certified compostable products along with the food scraps. If a facility accepts these products, then they will be accepted by the organics bins at these locations.

Acceptance at Businesses



The curbside organics bin at home is a different matter. The organic waste stream leaving private residences and multi-family buildings is complex, open to interpretation by each individual on whether the products/packaging they consume are suitable for the organics bin. This complex stream requires more strict limits on acceptance, to prevent contamination and keep compost quality high.

Acceptance in the Home Organics Bin



Some municipalities in North America have enabled organics bin acceptance of certified compostable materials by placing policies which require all quick-service food establishments to use either accepted, certified compostable products, or recyclable ones¹⁵.

In municipalities where a ban on non-compostable food products and packaging is not in place, facilities are more likely to restrict certified compostable products from being accepted in home organics bins whether or not the products typically work in the facility. This facility restriction is then enforced by municipal policy. In this second case, it's possible that compostable products/packaging are accepted by the facility if they come from a business or event, but acceptance is less likely when coming from a residence.

¹⁵ City of Seattle Public Utilities, 2015. *Food Service Packaging Requirements*. Retrieved from: <http://www.seattle.gov/util/ForBusinesses/SolidWaste/FoodYardBusinesses/Commercial/FoodPackagingRequirements/index.htm>

Backyard Compostability

Composting in the backyard is a worthwhile way to process organic waste that is much less energy-intensive than industrial composting. However, backyard composting usually differs from industrial processes by having lower temperature, variable moisture, uncontrolled and/or very little aeration, and a longer cycle time. These variable conditions mean that many products and packaging that are certified compostable for industrial facilities will take a very long time to break down in a backyard compost.

There are regional European certifications for home compostability, but no internationally recognized standard-creating body has yet issued a standard for home compostability certification.

Conclusion

Certifying a product as compostable through a third-party certification agency is an essential first step, but it does not guarantee acceptance at composting facilities. As a result of this, there are many products which are certified compostable but not readily accepted at compost facilities. Designers and product purchasers should consider all the factors that go into compost facility acceptance of their products, and obtaining acceptance at composting facilities will require liaising with stakeholders in the compost value chain across many jurisdictions.

More Resources

NZWC Design for Compostability in
Canada publication series

CAN/BNQ Standard 0017-088

BNQ List of Certified Products,
Website, <http://compostable.info/certified.htm>

BPI Certified Product Catalogue,
Website, <http://products.bpiworld.org/>

About the NZWC

The National Zero Waste Council is a cross-sector leadership initiative bringing together governments, businesses, and non-government organizations to advance a national waste prevention and reduction agenda in Canada. With a focus on influencing behavior and improving product design and packaging, the National Zero Waste Council aims to unite efforts in waste prevention and drive a fundamental shift in our relationship with waste. **www.nzwc.ca**

Reviewers

A wide variety of thought-leaders and practitioners, in addition to members of the National Zero Waste Council's Product Design and Packaging Working Group, have been consulted in the preparation of this white paper. These include but are not limited to:

- A&W Foods Inc.
- *Bureau de Normalisation du Québec (BNQ)*
- Biodegradable Products Institute (BPI)
- Canadian Plastics Industry Association
- Compost Council of Canada
- City of Edmonton
- City of Kingston
- Township of Langley
- US Composting Council's Sustainable Packaging Working Group



The **National Zero Waste Council** brings together leaders in government, business and community organizations to advance waste prevention in Canada.

www.nzwc.ca