



In the Crosshairs: Single-Use, Disposable Packaging

New Loop circular platform promotes reusable consumer product packaging

By Robert Grace

Plastics waste poses a massive global problem. But the real issue, according to Tom Szaky, is not the material, it's how we use it. The problem is society's single-use, disposable mindset. And the New Jersey-based entrepreneur is setting about trying to change that.

His latest project—the Loop circular shopping platform—has the potential to help reshape how we design, make, package, use, and reuse a diverse range of consumer products, from shampoo and razor blades to laundry detergent and ice cream. And Szaky has more than a few well-known supporters, from Unilever, PepsiCo, and Nestlé to Danone, Procter & Gamble, and UPS.

The 37-year-old, Hungarian-born Szaky lived in Canada from age four to his teenage years. He then attended Princeton University in New Jersey but dropped out in his sophomore year to focus on launching—together with colleague Jon Beyer—a recycling company called TerraCycle Inc. in Trenton, N.J. That was 2001. The company has estimated its 2018 revenue at about \$32 million. Its brand-funded free programs now operate in 21 countries, and the company says it has contributed millions of dollars to schools and nonprofits.

As TerraCycle notes on its website: “In nature, waste does not exist. All materials are reused or recycled through natural processes. However, modern human society and technology have created a massive waste issue. The creation of complex plastic polymers during and after the Industrial Revolution broke the closed-loop, sustainable system that had existed on Planet Earth for billions of years. Now,” it notes, “the irrepressible demand for safe, conveniently packaged consumer goods is annually creating billions of tons of non-recyclable or difficult to recycle waste.”



Szaky: “The real focus Loop has is in moving from single use to multi-use, from disposable to durable.” Courtesy of TerraCycle Inc.

TerraCycle built its reputation by focusing on the collection and repurposing of complex waste streams, involving the recycling of such products as cigarette butts and multilayer juice pouches that others just threw away. Still, its latest effort, Loop, is its most ambitious yet. Launched in late January at the World Economic Forum in



Launched in 2001 to collect and repurpose complex waste streams, TerraCycle Inc. now is focusing on promoting reusability versus disposability. Courtesy of TerraCycle Inc.

Davos, Switzerland, the Loop project has, if nothing else, stirred a big debate about reusable packaging.

Reinventing ‘the Milkman Model’

So, how does Loop work? The system uses UPS to ship a variety of food, household cleaning, and personal-care products in a reusable and collapsible, padded container called the Loop tote. The products are dispensed from reusable containers, which are returned in the same container when empty. Some have dubbed it “the milkman model,” in a nod to the old days when milk was delivered to your doorstep in glass bottles, which were later collected, cleaned, and reused.

“Loop,” maintains Szaky, “is an engine for CPGs [consumer packaged goods companies] to shift from disposable products that consumers own to durable ones they borrow.”

TerraCycle says it will launch the Loop platform this spring in the Paris area (in partnership with major French retail chain Carrefour) and in the northeastern United States (New York, Pennsylvania, and Delaware). It’s planning a London-area launch (with an unnamed U.K. retailer) this September, before expanding into Toronto early next year and in Japan later in 2020. Szaky says Loop will begin as an e-commerce model, and then “pivot into physical stores” later. Loop does not plan to have its



The soft, collapsible tote is the reusable package used for transporting new products to consumers, and for returning used containers to the Loop store. Courtesy of Loop

own stores, but rather to partner with existing retailers, which may eventually opt to designate “packaging-free aisles” in their stores.

In the Loop system (www.loopstore.com), unlike with products on today’s retail shelves, the brand owner owns the package—a fact that Szaky says gives such



companies the incentive to make attractive, durable, branded containers. This, he asserts, has the effect of “elevating the user experience” and making the package “more like luggage,” with no waste generated. Take, for example, Häagen-Dazs ice cream, which has created a handsome, double-walled stainless steel ice cream container (replacing the usual, disposable coated paperboard) for Loop that offers the added functionality of keeping the contents cold, while allowing the exterior to be comfortable to hold in the hand.

The Economic Equation

Loop’s general goal now is for each package to be reused at least 100 times, with some likely to be used many more times than that. While the upfront cost for producing higher-end Loop bottles or containers is more than for pumping out cheap, disposable packages, the per-unit cost decreases with each use, Szaky notes. This serves to lower the cost to brand owners. At three to four uses, the average container cost reaches break-even with its disposable counterpart, and at 10 uses, it becomes 50 to 75 percent better for the environment, he claims.

This double-walled, stainless steel Häagen-Dazs ice cream container for Loop is an example of what Tom Szaky calls “elevating the consumer experience.” (above)

The Loop shopping platform is a real-life example of the circular economy in action. (below) Courtesy of Loop



While consumers need to pay a modest deposit for the Loop tote and for shipping, with the use of just six or seven products, Szaky says shipping (both ways) essentially becomes free.

Consumers also will benefit from added convenience, he claims. One can use the free Loop app to place orders for products and choose an optional setting to auto-replenish the order whenever the user calls for a pickup of the used containers. Consumers also don't need to clean the used containers; Loop will hygienically clean and sanitize the empty packaging at its own facilities to make it ready for reuse.

TerraCycle is encouraged by some initial consumer testing it has done with 25 families in New York and 25 in Paris. Szaky says they learned from these trials that once consumers start receiving their products in reusable packaging, they start getting “allergic” to disposability.

For its part, Loop partner Procter & Gamble says it is working “to enable responsible consumption at scale.” Citing its brands such as Pantene, Tide, and Cascade, P&G Vice President and



Unilever plans to test a premium, refillable, stainless steel deodorant stick called *minim*™ with its Dove, Rexona, and AXE brands. While this is an example of metal replacing plastics, Unilever says, “We believe Loop will complement our existing efforts to create a plastic system that works and a packaging system that is truly circular by design.” Courtesy of Loop

Chief Sustainability Officer Virginie Helias, said: “We have developed new durable and refillable packaging that is delivered in a waste-free and hassle-free way as part of the Loop platform. We’re proud to partner with TerraCycle as the first CPG company to be part of this transformative program.”

Loop’s Packaging Mandate

In a recent telephone interview, Szaky noted that for a packaging material to be Loop-approved, it must be durable, cleanable, and have a positive lifecycle analysis (LCA). Waste-to-energy is not acceptable for Loop, he said. “It’s better than landfilling, but it’s a linear process, and the material can’t be reused.”

So, what does this mean for plastic packaging? For starters, the firm suggests that Loop packaging likely will be made from materials such as alloys (e.g., stainless steel), glass, and engineered plastics. It threatens to negatively impact some types of plastic containers (think disposable PET bottles), while offering growth opportunities for other types of container materials (think copolyester and polycarbonate).

As one example, Unilever says it will test a premium, refillable, stainless steel deodorant stick called *minim*™ with its Dove, Rexona, and AXE brands. Depending on usage, the product will last on average one month, with the packaging designed to last at least 100 cycles. This

means that each pack is expected to last about eight years—with the potential to save up to 100 packs from being thrown away. Between them, these three brands reach more than a billion people every year—“so,” the company notes, “the smallest change in the product can make a huge impact.”

Metals and glass are likely to replace some disposable plastics packaging, but plastics’ durability and design flexibility make it a strong candidate to be applied in new, creative, new ways.

“Plastic is in no way the enemy,” Szaky says. “There’s been a disproportionate amount of negative [publicity] projected toward plastics. I think plastic is an amazing thing. My only challenge is using it once. Single-use aluminum is just as bad, if not worse, than single-use plastics.”

David Blanchard, Unilever’s chief research and development officer, has been quoted as saying, “We believe Loop will complement our existing efforts to create a plastic system that works and a packaging system that is truly circular by design.” The company in 2017 made a commitment that, by 2025, all its plastic packaging would be reusable, recyclable, or compostable, and 25 percent of it would come from recycled plastic content.



Loop's Material Implications

Dr. Ernie Simpson, TerraCycle's global vice president for research and development, offered his take to Plastics Engineering on the material implications.

"On the Loop platform, we need materials that can withstand high temperatures during the washing, sanitization, and drying processes, in addition to chemical resistance from any acidic, salty, etc., foods." Additionally, he noted, Loop wants to aim for a certain user experience, driven by the feel and the perception of quality and durability that the Loop products have.

These demands immediately rule out fibers, Szaky notes. Similarly, multilayer, multimaterial packages will likely fail the LCA test because they cannot easily be recycled back into a similar product.

Simpson says TerraCycle has assessed many plastic types but has not yet been able to complete testing and validation on certain containers and materials given Loop's rapid market deployment. The company has, however, tested the following plastic materials, and Simpson offers the following impressions of each:

- » **Polycarbonate**—A strong, clear engineering thermoplastic that uses the building block bisphenol A (BPA). Although all global testing bodies have cleared traces of BPA as not being harmful, many consumers remain wary of using PC for food contact or for any materials where a trace of BPA would pose a problem. "Also," Simpson says, "because the Loop containers will require repeated washing at elevated temperatures, they will have limited hydrolytic stability"—meaning the ability of a plastic to resist decomposition in the presence of water particularly at elevated temperatures.
- » **ABS/polycarbonate blends**—A material without the clarity of PC but with similar performance. One major negative, he suggests, is its low fatigue endurance.
- » **Copolyesters** (such as Eastman Chemical's Tritan material)—"We currently have some Tritan containers in Loop for a few SKUs [stock keeping units]. Based on our testing and the general property profile of the material, Tritan has a very good chance of being used for containers for other SKUs." He adds that the material has outstanding dishwasher durability, chemical resistance, heat resistance, hydrolytic stability, drop impact resistance, glass-like clarity, global food-contact regulatory clearances, low taste and odor retention, stain resistance, and sterilization capable via microwave steaming and boiling water immersion.

- » **Polypropylene**—Reusable cutlery, plates, and bowls made from PP resin "have shown good promise in testing."
- » **High-density polyethylene (HDPE)**—Containers made from HDPE have been tested, Simpson notes. Their performance depends on shape, molded-in stress, and wall thickness. And they have shown a tendency to deform in the high-temperature washing cycle.
- » **Glycol-modified PET, etc.**—"We have tested some PETG containers," Simpson says, noting that, "although PET has high clarity and good chemical resistance, it has low hydrolytic stability, and is susceptible to deformation in the high-temperature washing cycle."

These observations clearly lay out some of the challenges facing plastic resin suppliers and bottle and container makers, at least from Loop's perspective.

And it's important to note that it is not only Loop that is pushing the reuse agenda.

The Berkeley Factor

The Berkeley, Calif., City Council in late January passed new legislation that its backers call the most ambitious municipal legislation in the U.S. aimed at reducing the use of single-use disposable foodware.

Under the new law, beginning on Jan. 1, 2020, food service customers in the northern California city will need to pay 25 cents for a disposable cup. Takeout food is to be served only using compostable dishes and utensils by January 2020, and dine-in food is to be served only using reusable dishes and utensils by July 2020. Additionally, disposable items such as utensils, straws, and napkins will be available only on request or at self-service stations.

What's interesting is that this law does not single out plastics but rather targets disposables as a whole, regardless of material. It's notable that Berkeley has earned a reputation as a bellwether for environmental changes nationwide.

A Feb. 19 report on Waste360.com declared: "Berkeley's policy represents a mammoth shift up the waste hierarchy, from recycling to reuse. Despite how much we talk about putting reduce and reuse first, we rarely actually do. Local communities almost always default to managing recycling because it is within their influence.

"Berkeley just redefined the boundaries of local policy," the article continued. "As one council member remarked,

this is a small leap of faith forward for the city, but it's a loud message to industry that communities (and their streets and waterways) will no longer be the literal dumping ground for single-use disposable packaging, be it paper or plastic, recyclable or compostable."

Consumers Hold the Key

And so the reuse train appears to be gaining steam, with all the potential implications that may mean for the packaging industry. Consumer acceptance ultimately will determine its success.

Referring to his new initiative, TerraCycle's Szaky stresses: "The real focus Loop has is in moving from single use to multi-use, from disposable to durable. Those are the incentives."

As of the late-January launch, he says Loop—which is adding to its current staff of about 60—had roughly 300 product SKUs in its program. He says he has kept the first-year numbers "purposefully low" to allow Loop to ramp up smoothly. But "after that, in years two or three, it expects to reach crazy scale," with major retailers able

to drive that growth.

"We are giving consumers the ability to experience their favorite products with way higher luxury and with new features—all without the concept of garbage existing. Tell me a consumer who wouldn't prefer that over what they have today."

ABOUT THE AUTHOR

Robert Grace is a writer, editor and marketing communications professional who has been active in B2B journalism since 1980. He was founding editor of and worked for 25 years at *Plastics News*, serving as editorial director, associate publisher and conference director. He was managing editor of *Plastics Engineering* from July 2016 through October 2017, and is now both editor of SPE's *Journal of Blow Molding* and directing content strategy for SPE. He runs his own firm, RC Grace LLC, in Daytona Beach, FL., and can be contacted at bob@rcgrace.com.



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