

Design Principles for Materials used in Reusable Packaging & Foodware Services

Highlights

- We support using materials that have the longest life and the least impact on the environment and communities sited near extraction, production and disposal facilities.
- Design for durability and use well beyond the “break-even point.”
- Design for health and safety.
- Design for smaller supply chains.
- Design for convenience and new consumer norms.
- Design for universal infrastructure.
- Design for accessibility and inclusivity.

At Upstream, everything we do is in service to the mission of helping people, businesses and communities shift from single-use to reuse. To that end, we are often asked about our analysis of the different types of materials used for reusable packaging and foodware – which include aluminum, stainless steel, glass, ceramics and different types of plastics.

In short, we support using materials that have the longest life and the least impact on the environment and communities sited near extraction, production and disposal facilities.

But we also recognize that businesses have requirements and considerations, and that there is no one-size-fits-all solution. So we’ve developed these principles to guide design considerations and decision-making for businesses.



Life-cycle Analyses as Assessment Tools

In detail, when it comes to the health of the planet and its people, each material and product is associated with a complex set of considerations.

The primary tool we have to assess the environmental impacts for different types of materials are called life-cycle analyses or assessments (LCAs). Researchers plug in different assumptions as to how the reusable packaging will be served (and collected, washed and reused), and can compare the different *upstream* and *downstream* environmental impacts of each option.

Impacts and Limitations of Reusable Packaging Materials

For the planet, reuse beats single-use across every environmental metric. But different reusable packaging materials have different environmental impacts and functional limitations that make choosing materials a complicated endeavor.

To add another layer of complexity, reusable packaging and foodware services are circular systems, not one-way products like disposable packaging. And systems can produce widely different outcomes based on how they're designed and run in practice.

The environmental performance of the overall system is in general more important than the materials chosen.

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Principles for Reusable Product Design and Materials

We believe that decisions around the materials chosen for reusable packaging and foodware – and also how the services are designed and run – should incorporate the following principles:



1. Design for durability and use well beyond the “break-even point.”

The break-even point is the number of times a reusable product must be used in order to exceed the environmental benefits of a comparable amount of disposables (e.g. after two uses, a stainless steel fork starts to accrue environmental benefits over a disposable plastic one).

The more a reusable product or package is washed and reused past the break-even point, the more environmental benefits accumulate, and the greater the cost savings for business.

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When choosing from different materials, businesses should seek to get as many uses as possible out of the product. How the consumer treats the package or product can play a significant role in the number of times the product gets reused.

Reuse businesses should evaluate not only how many times the products are designed to be reused, but also the number of times that they are actually reused in

practice. This includes minimizing product loss, which may seem obvious given that businesses want to avoid losing money, but some reuse services tolerate significant amounts of product loss. Their business model may still work, but environmental benefits are minimized in the face of high product loss.



2. Design for health and safety.

While food-contact materials should be free of toxic substances, the federal government is woefully behind on screening chemicals for health and safety.

Many classes of chemicals that cause harm are still allowed in disposable and reusable materials alike. Reusable foodware and food packaging should not contain chemicals that have been identified as chemicals of high concern by reputable scientific institutions like the [Food Packaging Forum](#).



3. Design for smaller supply chains.

One of the best parts about reuse services is that they require the development of more regional supply chains, which create economic opportunities and jobs.

For example, instead of disposable take-out containers being shipped from hundreds or thousands of miles away, reusable take-out container systems require the creation of regional washing hubs and new jobs and infrastructure in collection, logistics, washing and restocking.

In general, the smaller the supply chain for the reuse service, the more environmental benefits accrue from the smaller transportation loops.



4. Design for convenience and new consumer norms.

We know that the one-way, throw-away disposable norm was effectively sold to business and consumers over decades. Disposability is also the gold standard for convenience.

But as the widespread adoption of recycling shows, consumers can and will behave differently if sufficiently motivated and guided to the proper action.

At first, reuse systems require significant public engagement and education to shift behavior, but over time, these efforts will pay off in more products and services being able to be delivered in reusables.

In order to achieve widespread adoption, reuse services should be designed for convenience and for the different ways that consumers engage with the products. Enabling consumers to return reusables to point of purchase – while also offering multiple accessible places for drop-off and/or home or office pick-up options – impacts success.

The more convenient options available, the higher likelihood of participation.



5. Design for universal infrastructure.

Reuse infrastructure stands today where recycling infrastructure was 40 years ago.

It's going to take the same public and private investment and innovation to create convenient reuse systems that enable the consumer to “reuse” at home, at the office or school, at a venue or event, or on the go.

Partnerships that allow multiple businesses to utilize the same collection infrastructure will be one of the keys to enabling reuse to scale.

6. Design for accessibility and inclusivity.



If we want reuse to be the new normal, we have to make sure that it is accessible to everyone.

This means removing barriers to consumer participation, like excessive costs. It also means ensuring that businesses prioritize access and deployment in communities of color and low-income communities to participate in, launch and operate reuse systems.

We recognize that businesses have a lot to consider when choosing materials, including functionality, consumer preference, cost, branding, and more.

But when it comes to the health of the planet and its people – and the bottom line – designing with these principles in mind can go a long way toward mainstreaming reuse while maximizing environmental and societal benefits.