

# Can an innovation lab end the 'box in a box'? Amazon thinks so

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Credit: Unsplash/CC0 Public Domain

Inside an Amazon facility in Sumner, Washington, a package falls 17 times.

Nearby, other packages sit under the weight of 30,000 pounds or are squished together between two clamps, hopefully avoiding any folding under pressure.

These doomed packages aren't headed to a customer's doorstep and aren't moving through Amazon's usual network of warehouses. Instead, they're [lab rats](#).

In Amazon's Packaging Innovation Lab—a 10,000-square-foot facility in a complex of Amazon buildings in Sumner—packages are put through the wringer. The lab has a machine to simulate the bumpiness of the back of a semitrailer, as well as one that mimics slamming into the walls of those trailers if the driver pumps the brakes. It has extremely cold chambers, and extremely humid ones. And it tests falls—on every side of the box, following a specific 17-drop protocol.

The lab aims to cover the entire delivery process from "pack-to-porch," said Justine Mahler, Amazon's director of packaging innovation. It's part of a testing protocol that Amazon has set up to improve its packaging, aiming to reduce the amount of plastic, cardboard or other materials it uses to ship items. The ultimate goal, Mahler said, is to get rid of packaging altogether.

The Packaging Innovation Lab is one of Amazon's efforts to reduce the considerable amount of pollution it generates. On the road, it hopes to shift toward electric delivery vans. In its [data centers](#) and corporate buildings, it plans to switch to renewable energy. In its warehouses, it wants to reduce the amount of packaging used for each shipment while ensuring each product arrives on time and undamaged.

Amazon says it's making progress but [environmental groups](#), employees and stakeholders are increasingly calling on the company to do more.

"Being one of the largest retailers, they have one of the biggest opportunities to make a difference," said Pam Clough, an advocate with Environment Washington. "And right now, they're not stepping up."

Nearly 2,000 corporate workers pledged to participate in a walkout in May to demand Amazon do more to address its impact on the climate. Activists have also gathered outside the company's Seattle headquarters to ask Amazon to reduce emissions. About 30% of investors voted in favor of a resolution at the company's annual shareholder meeting last month that would require Amazon to set a goal for reducing its use of plastics.

Amazon says it's taking cues from its customers, who are encouraging the company to move away from single-use packaging, excessive packaging and anything that feels wasteful, said Patrick Lindner, the vice president of packaging and innovation.

"They continue to bring insights to us," he said. "The nice thing about working here is we've got solutions for that."

## **Packages in the wild**

Amazon began focusing on packaging about 10 years ago, but that effort has really ramped up as orders skyrocketed with the COVID-19 pandemic, Lindner said.

Amazon had mastered the other two important parts of shipping—arriving on time and undamaged, Lindner said. So it could turn its attention to eliminating waste. "If we aren't doing those [first two] well and we're not meeting customers' expectations, then we never really get a chance to drive the sustainability piece," he said.

Amazon first opened its Packaging Innovation Lab in 2009, in what was

one of its first corporate buildings on Rainier Avenue in Seattle. In 2022, it moved the lab about 30 miles south to Sumner, where it neighbors an experimental fulfillment center and a partly operational one. The Innovation Lab goes by the name BFIX, following the same naming scheme Amazon uses for its other Washington fulfillment centers, like BFI3 in Dupont and BFI4 in Kent.

The lab has about 20 workers, some who have engineering backgrounds and others who worked in Amazon warehouses, where they saw what was working and what wasn't.

Throughout its network of fulfillment centers, Amazon now has buttons for employees to give feedback on packaging as they move items into, out of and around the warehouse.

The Innovation Lab runs about 100 tests a week. It also trains labs around the world to do their own tests, and then reviews tens of thousands of results from those each week, the company said.

For comparison, Amazon says it delivers more than 10 million customer packages globally every day.

From the lab, Amazon sends information to manufacturers, suppliers and vendors, as well as analyzing some of it on its own. Those [data points](#) can then help make decisions about the best way to package an item—balancing that desire to reduce packaging while ensuring the product is on time and in good condition.

"We know our packaging goes into the wild," Mahler said.

## **Innovation spillover**

Environmental groups, researchers and Amazon itself say it's so

important for Amazon to reduce packaging because people buy so much on its marketplace. Amazon accounts for 37% of the e-commerce market in the United States, according to Statista, a data and statistics company.

"What Amazon does so wonderfully is to get people to consume more," said Deepak Rajagopal, an associate professor at UCLA's Institute of the Environment and Sustainability who studies the life cycle of products from manufacturing to recycling or landfills.

Rajagopal said he thinks about Amazon from two different perspectives. On one hand, Amazon is working to find ways to reduce packaging. On the other, it's trying to make it easier for customers to shop online, which is naturally going to increase the amount of packaging needed overall.

Amazon's size can be beneficial, though, Rajagopal said. Because it's so big, it can afford to innovate in ways smaller companies can't. And if Amazon finds a good solution, it can pass it along to others. In industry parlance, that's called "innovation spillover."

Packaging itself isn't expensive, Rajagopal said. But as consumers increasingly start paying attention to the amount of waste that comes with their purchases, overpackaging can have a cost.

"If anything, the hook for them is 'Hey we can tout ourselves as green,' " he said. "For the people who care about it, it just brings more business."

Amazon says it's already making progress on reducing packaging. It says it has cut 1.5 million metric tons of packaging material out of its waste stream since 2015.

In 2019, Amazon introduced a paper-padded mailer and partly replaced those slim plastic packages lined with something similar to Bubble

Wrap. The company tested the durability of that new mailer in its Packaging Innovation Lab.

In 2021, Amazon said it reduced the weight of plastic packaging per shipment by 7%. Last year, the company said its work to reduce the amount of paper for each package saved about 60,000 tons of cardboard annually.

Based on the company's own numbers, Amazon used roughly 97,000 metric tons of single-use plastic across its global operations in 2021, the most recent data available.

But some environmental groups question Amazon's progress and are asking the company to do more.

Oceana, an ocean conservation group that has studied Amazon, said Amazon's plastic pollution is actually going up. Oceana estimated Amazon generated 709 million pounds of plastic packaging waste in 2021, up 18% from its 2020 estimate.

Amazon has pledged to reduce its plastic use in some markets, but has stopped short of doing in the U.S., according to Oceana. A shareholder resolution that asked Amazon to commit to reducing its plastics use by one third did not pass at the annual shareholder meeting in May.

"While we've eliminated tens of thousands of metric tons of new plastic each year in North America, we know we still have work to do," Lindner said in a prepared statement. "We are committed to minimizing single-use plastics in our packaging all around the world, as well as eliminating additional packaging altogether."

Matt Littlejohn, [senior vice president](#) for [strategic initiatives](#) at Oceana, pointed to Amazon's packaging lab as one sign the company does have

the resources to reduce its plastics use.

"It seems like they have the solution already—and if they needed to develop additional ones, they could do it," he said. "It appears to us that it's more a matter of will."

## From TVs to Crock-Pots

During a tour of the lab in May, Amazon representatives weren't talking about plastics. Instead, they were most focused on a program that would help manufacturers ship products through Amazon's network of warehouses without adding any extra Amazon packaging.

In other words, Amazon wants to stop putting a box in a box.

Amazon uses machine learning to determine which products are naturally eligible to ship in their own container, like a toy that already comes in its own branded box or a blanket that doesn't need any extra protection.

For items that aren't a natural fit, Amazon works with vendors to adjust their own packaging to find ways to make it stand on its own.

In 2022, about 10% of products that moved through Amazon's warehouses were shipped without Amazon packaging, the company said.

Mahler, the director of packaging innovation, said the lab does a lot of testing on TVs because they are relatively fragile and historically have had a lot more [packaging](#) than needed. "If we can get TVs to do it, Crock-Pots better come in line," she said.

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