

# FAQs ON RECYCLING PAPER CUPS FOR PAPER MILLS

*As paper mills consider whether to accept bales containing paper cups, mills may have a variety of questions. Below are answers to some of the most anticipated questions:*

## **Why should I accept bales with paper cups?**

Paper cups are typically made with long, virgin fibers, something all mills find valuable. And, at a time where traditional sources of fiber – like newsprint and office paper – are in decline, mills may be looking for new sources of valuable fiber. In addition, cup fiber may lend strength to short fiber.

## **What materials are found in a typical paper cup?**

Paper cups typically consist of bleached white virgin fiber with a thin polymer coating. Often, this coating is made from polyethylene (PE), but sometimes polylactic acid (PLA) is used. While wax may have been a common coating in the past, this is not true today. They also don't include wet strength chemicals, as they are not needed when a poly coating is used. Cups may contain low levels of starch.

Cups for hot liquid applications typically have one polymer layer on the inside of the cup, while cups for cold applications have two polymer layers, one on the inside and one on the outside. This coating provides insulation and helps prevent leaks. The coating ranges from roughly 5 to 12 percent by weight of the finished cup, depending on whether it's a cold or hot cup, and whether it has a PE or PLA coating.

While polymer coatings are used on almost all cups today, new repulpable water-based coatings are entering the market that can replace the traditional poly coatings.

Hot cups have printing ink directly on the fiber, while cold cups have ink on the exterior polymer coating. This is an important distinction, considering not all mills have deinking capabilities.

## **What happens to the poly coating after the pulping process?**

That depends on the mill. In most cases, the poly will be sent to a landfill with any other residuals. In other cases, a mill may be able to recycle it or send it to a waste-to-energy facility. The industry is also working on processing innovations. For example, an emerging technology utilizes heat and pressure to extract usable fiber from polycoated and food-soiled packaging.

## **In which bales can I expect to see paper cups?**

Based on the findings of a MRF flow study conducted several years ago (highlights found [here](#)), paper cups typically end up in mixed paper (ISRI grade #54) or carton bales (ISRI grade #52). They may also be sorted into other bales, like sorted office paper. Incoming material, operational considerations and preferences of paper end markets are factors used by the MRF to determine which bales will contain cups.

### **What fiber yield can I expect when recycling paper cups?**

Yield correlates closely to the percent fiber versus polymer by weight, therefore fiber yields can be expected in the roughly 88 to 95 percent range. Yield may be higher with new repulpable coatings.

### **Won't my mill be flooded with paper cups if I decide to accept them?**

While paper cups are part of our busy lives, the reality is that they are a very small part of the recovered fiber stream. According to industry estimates, there are roughly 600,000 tons of paper cups produced annually in the U.S. That is less than one percent of all paper and paperboard produced in the U.S. in 2018.

Research sponsored by the Foodservice Packaging Institute found that if the paper cups are included in a mixed paper bale, you can expect less than 0.5 percent of that bale to be paper cups. This is based on industry estimates as well as bale audits of residential mixed paper from two cities (New York City and Seattle) that accept paper cups for recycling.

If the paper cups are directed to a carton bale, you can expect 25 percent of that bale to be paper cups, based on industry estimates. According to one mill currently accepting bales with cartons and cups, cups represent about 10 to 20 percent of the bale. Adding cups to this bale provides additional volume, which may be desirable given that cartons are another low-volume commodity.

### **Aren't cups too contaminated with food to be recycled?**

No. Cups and other foodservice packaging items are no more contaminated than commonly recycled food-contact items like bottles, jars or cans. This assertion is based on two studies done in Boston and Delaware that examined food contamination found in curbside recycling programs. And, in both studies, the majority of the samples of foodservice packaging was rated as low-residue (1-2 on a scale of 1-5). Read more about the studies [here](#) or watch the webinar on this topic [here](#).

Since cups are used to contain liquids, the contents are easily emptied (and residents are likely to empty the cups before recycling to avoid spills in the home). In addition, any liquid left in the cups when recycled is expected to drain out during transport to the MRF.

### **Will I be able to process bales with paper cups?**

That depends. All mills are different. As mill equipment and capabilities vary, it is recommended that mills conduct trials before accepting cups. Some mill experience suggests that the polymer coating can separate readily during pulping in both continuous and batch pulping processes. Mill cleaning systems enable the removal of the separated polymer strips from the pulping process. However, other mills have reported challenges with effectively separating the polymer coating in their pulping processes and/or cleaning systems.

### **If my mill wants to run a trial first, what should I consider?**

If you're interested in running a trial, first know that we are here to help! Having helped other mills with trials, here are a few considerations:

- *Sourcing cups:* If you need help sourcing paper cups, or bales with paper cups, please let us know. It's up to you whether you want to run a trial with just pre-consumer cups, or post-consumer in a bale of your

choice. You may want to start with pre-consumer, and if that's successful, move to post-consumer bales. We can also help you determine the quantity of cups to include in the trial, based on the expected volumes of cups in the marketplace that are available or expected to be recycled.

- *Metrics:* You probably have metrics you'll want to track, but be sure to note the following (applicability may vary depending on whether you are running a trial with pre- or post-consumer cups):
  - Whether fiber is being consumed or is part of the tailings coming out of the pulper
  - Amount of poly in the pulper
  - Acceptability of polycoat (as a percentage)
  - Yield of typical bales containing paper cups
  - Yield loss
  - General contamination level in bales
  - Non-fiber material in bales
  - Storage issues: degradation of bales while in storage; storage time; storage requirements
  - De-trashing composition
  - Odor and insect/rodent presence
  - Residue
  
- *Length of trial:* This is for each mill to decide, but it's assumed that it will be for a finite period of time, providing the mill an opportunity to better understand the processing capabilities in mill operations, including the pulpability and yield of this material. A minimum of eight hours is recommended.

### **What's the next step if I decide I'd like to accept post-consumer paper cups in my mills?**

First, let us know in which fiber grades/bale types you'll accept cups. Ideally, you're willing to communicate this acceptance publicly and be placed in our online end markets map (found [here](#)) and list (found [here](#)). But, if you prefer a less public approach initially, we'll work with you to find a suitable one. For example, you can communicate this via your buyers to your existing suppliers. We can also help by letting MRFs in your region know of your willingness to accept bales with paper cups (feel free to reach out directly, too!).

Finally, if you really want some added exposure, we're always looking for paper mills to highlight successful paper cup recycling. Just let us know and we'll contact you regarding future articles, speaking opportunities, etc.

*Produced by the American Forest & Paper Association and FPI's Paper Cup Alliance.*