

A CIRCULARITY WIN

Collaborative problem solving to increase post-consumer recycled content in stadium cups

The Challenge

Creating a truly circular economy for plastics is admittedly easier said than done.

There are a variety of challenges that come into play when designing plastic products for circularity—ranging from human inconsistency to lagging recycling infrastructure to concerns over product performance when using post-consumer recycled (PCR) content.

Brand owners are eager to increase their products' sustainable attributes, and utilizing PCR material is a relatively straightforward way to invite circularity into the equation. But incorporating recycled content into products or packaging can't compromise expected customer performance. This was the situation Churchill Container found itself in when developing new sustainable offerings for their stadium cups.

Given the molding process, as well as the design of the cups themselves, the company found that 10% PCR was the highest it could go without impacting performance or processing. Churchill Containers needed a solution that would not require injection speed or pressure adjustments, and they wanted to retain the cooling process and overall cycle times.

To create reusable cups with a higher percentage of PCR content, revisiting the resin

formulation was a must—the primary way to include or increase recycled content in these stadium cups was through resin formulation. Churchill Container hoped to find a resin formulation that increased the PCR makeup of the cups with no impact to the durability and performance expected of a branded stadium cup.

The Solution

Churchill Container approached PureCycle and Milliken & Company to develop a suitable polypropylene resin that would increase PCR material usage without sacrificing performance and quality, or impacting the molding process.

PureCycle, thanks to its ground-breaking patented recycling process, can separate color, odor, and impurities from plastic waste feedstock and transform it into ultra-pure recycled (UPR) resin. UPR resin offers virgin-like performance using 100% recycled content and seemed like the ideal fit for incorporating more recycled content into a Churchill Container cup.

But the design team still had to address the slow melt-flow rate traditionally experienced when using recycled polypropylene (rPP) during the molding process. Using Milliken's Viscosity Modifier, Churchill Container could increase the melt-flow rate to create a more consistent flow by

shortening the UPR resin's average molecular chain length. Increasing the stability of the resin's melt flow meant that more UPR resin could be incorporated during the molding process.

The Result

Using Milliken's Viscosity Modifier, Churchill Container could add more PureCycle resin in the molding process—scaling up the recycled content used to 50% PCR material.

These durable and reusable souvenir cups comprising 50% recycled content will soon be available for people to use at various U.S. sporting and event arenas.



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