



Bottle to bottle for recyclers

Can label innovation lead us toward a closed loop value chain?



Summary

Strong, lightweight, transparent and highly versatile, polyethylene terephthalate (PET) plastic is the ideal material for consumer packaging such as water and soda bottles. Yet one of the traits that makes PET equally valuable to brand owners is its tremendous potential for recyclability.

Up to 100 percent of a PET bottle can be made using recycled PET (rPET), according to the National Association for PET Container Resources (NAPCOR). More impressively, there's no limit to the number of times PET material can be reused in bottle-to-bottle applications.

Consequently, PET recycling represents a tremendous opportunity for big bottle brand owners such as Coca-Cola, Nestlé and Pepsi, which produce and sell billions of PET bottle products each year. These brands have a vested interest in promoting PET reclamation efforts, not just to keep plastic bottles out of landfills but to provide sustainable packaging solutions for customers and to move toward a greener supply chain.

Why design matters

PET plastic is one of the most recycled materials on the planet. Yet the ability of PET reclaimers to meet the growing demand for rPET material is often undermined by packaging choices made by brand owners, bottle designers and manufacturers.

To get a final, marketable rPET product, recyclers need to separate ink, label adhesive, coatings or other bottle packaging materials from the pure PET plastic. They typically achieve this by placing bottles in a hot caustic bath for about 15 minutes — a process that divides non-PET material such as caps, label stocks and adhesives, which float, from the clean PET plastic flakes, which sink. When incompatible label materials go through this process, they can stick to or sink with the PET and



contaminate final yields. Therefore, recyclers are able to garner the most rPET material when packaging materials such as labels, caps and closures are designed to easily separate out during the recycling process.

Creating a sustainable bottle-to-bottle application requires brands, packaging designers and manufacturers to produce PET packaging that works in harmony with the recycling stream, especially the sink/float washing process. The Association of Postconsumer Plastic Recyclers (APR) suggests choosing packaging materials that conform with its APR Design for Recyclability™ Guidelines, including labels that float in water, inks that don't bleed and adhesives that don't disperse on the PET regrind.

The issue isn't just education. Increasingly, brands are recognizing that design is a critical component in promoting efficient PET recycling. Yet there is still a lack of packaging options on the market that are both recyclable and offer the same performance, marketing and shelf appeal as nonrecyclable options. The challenge for brands in using sustainable packaging materials is identifying innovative solutions that are recycle friendly and offer consumer appeal.

CleanFlake™ label trials

To help brands meet their goals for bottle recyclability and design, more label designers and manufacturers are working to develop PET packaging technologies that conform with APR guidelines and promote bottle-to-bottle applications.

Global packaging company Avery Dennison has introduced a "switchable" PS label adhesive for PET bottles. The goal was to give brand owners the same adhesive and design benefits as PS adhesive labels, while giving recyclers a label that is easy to remove and 100 percent recyclable. Using proprietary technology, the label is designed to easily detach from a PET bottle during the recycler's sink/float process for better recyclability.

To test how the switchable label technology would perform in a full PET recycling atmosphere, Avery Dennison collaborated with brand owners to develop sample label designs using the technology and conducted bottle-to-bottle trials with several mid-sized production recyclers. The company

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provided participating recycling plants with two sets of PET bales, one with bottles using the switchable label adhesives and one with unlabeled bottles as a control group. The technology was developed to work seamlessly with a reclaimer's existing equipment, so participants were only asked to resume their typical processes and monitor the results.

Closing the recycling gap

At the end of the CleanFlake trials, Avery Dennison asked recyclers how the bottles with its label adhesive fared compared to the control group without labels. They specifically looked at variables such as contamination levels, rPET yields and ease of use, based on criteria developed by Plastics Forming Enterprises LLC (PFE), an outside plastics consulting and research firm.

The response was overwhelmingly positive. PFE found that this material passed its standards of testing for recyclability, and all participants agreed that the trial adhesive separated easily from the PET flake, reducing contamination and improving their rPET yields. In fact, when the Avery Dennison-labeled bottles were compared with the nonlabeled batch, the final PET flakes were identical. Best of all, recyclers didn't have to change any of their processes to get the results.

PET recycling has the potential to provide a long-term sustainable stream of plastic material for billions of bottled products. Yet incompatible packaging design continues to undercut many efforts of rPET stakeholders. By offering packaging solutions that make PET recycling more economical for reclaimers and feasible for brand owners, companies such as Avery Dennison are helping close the loop for bottle-to-bottle recycling and see its true potential realized. >

