



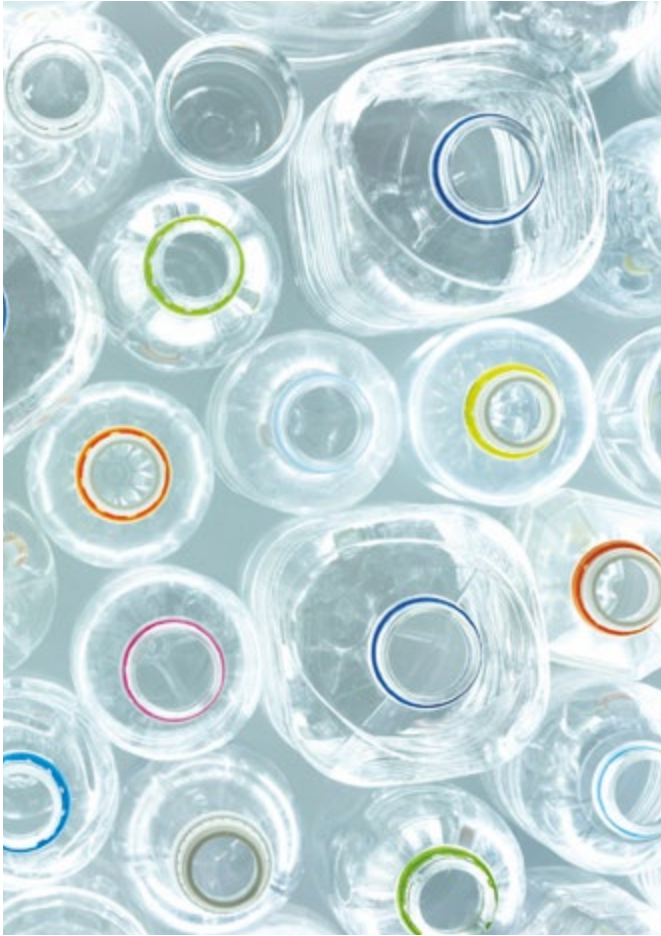
**PET bottle recycling made  
easier, with the Avery Dennison  
CleanFlake™ portfolio.**



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# Label material advances allow brand owners to improve recyclability



Advances by Avery Dennison have levelled the playing field for PET recyclability and shelf-impact. Until now, there has been a trade-off between the two; however, the Avery Dennison CleanFlake™ portfolio is designed specifically for the PET (polyethylene terephthalate) recycling stream.

PET is a popular plastic packaging material for food and non-food products because of its strength, thermo-stability and transparency. Bottle-to-bottle recycling reduces landfill, enables up-cycling into food-grade rPET and capitalizes on the renewable energy in a PET bottle. A collective impact on sustainability is made by brand owners, packaging designers, raw material suppliers, converters, retailers, consumers and waste management companies. The overall goal is making it easier to recover more materials, and brand owners are now looking beyond package design. They recognize that sustainability can offer a significant point of differentiation, as retailers' demands and consumers' awareness about the environment and natural resources carry increasing weight: more sustainable brands are more likely to be put on store shelves and into shopping bags.

"NAPCOR applauds Avery Dennison and its customers for addressing a critical impediment to the efficient recycling of PET containers," said Mike Schedler, National Association for PET Container Resources (NAPCOR) Director of Technology. "The popularity of pressure-sensitive labels makes it imperative that they be successfully removed as part of the standard PET reclamation process to increase their recyclability. We hope other label manufacturers and brand owners follow Avery Dennison's lead."

## Promoting sustainability, creating shelf appeal and capturing market share

Whether it's a private label or a national brand, consumers will only spend about 2.5 seconds at the shelf deciding what product to buy. So what influences them the most? Increasingly, it's brand recognition generated by compelling graphics and curvaceous containers. These two elements are the primary differentiators for in-store purchasing decisions.

But enveloping a shapely container with the eye-turning graphics of pressure-sensitive labels is not easy. Avery Dennison understands the consumer product market for PET packaging and the ongoing necessity to deliver innovative labels that perform on the shelf and reduce environmental impact. A more sustainable value chain is a driver

for its latest pressure-sensitive label constructions, which are designed to improve recycling efficiencies and the overall quality of post-consumer plastics.

Pressure-sensitive labels limit PET recyclability into food-grade rPET, due to adhesive contamination. However, Avery Dennison has developed a "switchable" pressure-sensitive label adhesive, SR3010, which can be "turned on" or "turned off" depending upon the environment or external stimuli. The water-based adhesive adheres to the PET bottle until the very end of its lifecycle, when the cohesive bond is broken at the recycler in the sink/float process, enabling the pressure-sensitive label facestock and adhesive to cleanly separate from the PET flake.



No residual adhesive remains on the PET flake, which could contaminate, discolour or otherwise diminish the value of the rPET. The “switchable” functionality is unique to SR3010, and not found in Avery Dennison’s general-purpose emulsion adhesives. Formulation of SR3010 is complex, requiring a switching mechanism and specialized components to turn the adhesive “on” and “off.”

### **EPBP-approved PP facestocks**

The Avery Dennison CleanFlake portfolio is a bottle-to-bottle recycling solution that offers two pressure-sensitive facestock options—clear and white PP. Both film stocks have a density of less than 1.0, and the clear film has already passed the European PET Bottle Platform (EPBP) recycling standard, for PET containers with filmic self-adhesive labels<sup>1</sup>.

Along with the acrylic water-based adhesive, the clear and white facestock materials benefit from an ultra-thin PET23 liner, further pushing the sustainability envelope.

The 100% recyclable clear and white PP facestocks deliver the same quality, clarity and performance as traditional pressure-sensitive materials. They are compatible with flexo, gravure and offset printing techniques, so brand owners have a simple, yet immediate, label replacement strategy that makes PET product packaging recyclable and safely reusable.

## **Increasing and improving PET recycling**

According to a market study by Smithers Pira, the global consumption of PET packaging will reach an estimated 19.1 million tons by 2017. PET consumption will continue to rise as brand owners look for creative ways to bring products to market. However, stronger legislative and resource protection programs are driving the need for sustainability. As such, the potential exists that a full reclamation infrastructure will not yet be established to effectively process these materials.

It is clear that reclamation facilities are vital to the industry. The need for more facilities is obvious, but those that are online today must be effective at sorting and processing. To make bottle-to-bottle recycling a workable venture, residual contamination of the PET recycling process due to label materials must be resolved.

These facilities buy post-consumer bottles, then sort and clean them to produce a viable flake for remanufacturing. Contamination within recycled PET can lead to colour issues, loss of intrinsic viscosity, loss of clarity, extruder drip and black spec inclusions. Unfortunately, the end result is that contaminated materials are suitable only for down-cycling into lower-grade products. A greater reinvestment in technology is needed that makes it possible to up-cycle the regrind into something of greater value or use, thereby reducing waste and the need for virgin material.

## Improving PET quality

Contamination in the PET recycling process has been a longstanding issue for everyone involved in recyclable packaging. All plastic labelling choice, from pressure-sensitive to shrink sleeve, impact upon PET packaging design and recycling. The use of plastic labels with a specific gravity of less than 1.0 is recommended. These are preferred because they are easily removed in conventional water-based density separation systems. It is recommended avoiding label systems that sink in water since the substrate, inks, decoration, coatings and the top layer become contaminants in recycled PET flake.

Once separated, the PET bottles and their labels move onto grinding. Labels that stay on through the granulation and elutriation process can be separated from PET flakes for best quality.

At drying temperatures of 165 degrees centigrade or lower, label materials tend to clump and stick in the dryers, requiring costly and unscheduled maintenance. It is also critical that the label be fully removed from the flake for subsequent processing. Finally, care must be taken to select caustic-resistant ink systems, to avoid bleeding into the wash during processing.

## A sustainable PET recyclable solution

Finding a solution that can maintain the integrity of the PET recycling stream is vital to the sustainable practices for brand owners and converters, the goal of which is to reduce, reuse and recycle. The challenge for packaging decision makers in turn is to improve PET packaging in a way that

enhances recyclability, especially for closed-loop, bottle-to-bottle operations. As a solution Avery Dennison introduced CleanFlake, a new label material designed to enhance PET bottle recycling.



Brand owners are increasingly aware of the global significance of maintaining the integrity of the PET recycling stream. To address the issue, reclaimers encourage the use of plastic label materials with a specific gravity of less than 1.0, as well as attributes like perforations on full-wrap shrink labels, which aid removal and improve the overall recycling process.

Another option for a long-term solution is using a label that floats when processed, which is compatible with the existing label stream and PET recycling infrastructure, and which is consistent with the Design for Recycling Guidelines established by the EPBP. For more information, see [www.petbottleplatform.eu](http://www.petbottleplatform.eu)

## About Avery Dennison

Avery Dennison (NYSE:AVY) is a global leader in labeling and packaging materials and solutions. The company's applications and technologies are an integral part of products used in every major market and industry. With operations in more than 50 countries and 26,000 employees worldwide, Avery Dennison serves customers with insights and innovations that help make brands more inspiring and the world more intelligent. Headquartered in Glendale, California, the company reported sales from continuing operations of \$6.1 billion in 2013. Learn more at [www.averydennison.com](http://www.averydennison.com).

<sup>†</sup> The inks must be non-bleeding, have a high chemical resistance and have low migration

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