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Empowering the label industry

ROLE OF SELF-ADHESIVE LABELS IN **PET RECYCLING**

JUNE 2024

SELF-ADHESIVE LABELS DESIGN FOR RECYCLING

Design for Recycling and eco-design of packaging is a multi-disciplinary and criteria based process to develop products that will have the best positive social, environmental and financial impact. It gives guidelines throughout the whole development process, from the ideation to the implementation, on how our product impacts the entire value chain. Producers of Self-Adhesive Labels (also known as pressure sensitive labels) follow Eco-design principles to develop products that fit ideally different packaging types.

Self-Adhesive Labels are designed depending on the requirements for the end-use application. The labels are applied with a variety of adhesives, including ones that are permanent, semi-permanent, or wash-off, heat- or cold-resistant, as well as moisture-resistant. Brands and converters have a great variety of options to choose from and are the key decision makers in the selection process.

Self-Adhesive Label producers have been successful in developing a label (= facestock + adhesive) that will cleanly remove from the specific packaging material (e.g. a label which enables PET recycling) without leaving any residue on the primary package. However, while these options are available on the market, still a majority of the labels currently used incorporate permanent adhesives and not the specifically developed wash-off adhesives.

EDUCATION IS KEY!

It is critical that brands and converters choose the best option available for the packaging, that combines brand and product safety communication needs together with packaging recyclability.

All members of the ecosystem should follow the Eco-design approach, think about the whole life cycle of the major packaging component and enable circularity starting at the design phase.

PET RECYCLING AND SELF-ADHESIVE LABELS

PET recycling process

In the recycling of PET bottles, the shredded PET flakes need to be clean and free from any contaminants and labels after the different washing steps of recycling. Typically these washing conditions are at 60-85°C in a 1% caustic solution. The sink/float process is crucial to separate the PET flakes and the label/cap materials.

Self-Adhesive label (SA) solution which enables recycling: Wash-off

The switchable adhesive sticks firmly during the use phase of the package, but "switches off" in the washing and sink/float recycling processes, allowing the label materials to cleanly separate from the PET flakes and float to the surface of the sink/float tank. This wash-off solution is applicable to a wide range of PET packaging, such as PET bottles, clamshells, trays, and jars for products across the food, beverage, and home and personal care industries. These solutions have been in the market for years and have been endorsed by different organisations.

Wash-off adhesive technology aims to increase amount and quality of primary packaging (which has the highest value) that can be successfully recycled and to bring more recycled PET back into the supply chain, ideally bottle-to-bottle recycling, closing the loop.

ROLE OF BRAND OWNERS AND CONVERTERS

Education takes center stage here: Brand owners may need to better understand and take responsibility for using the correct self-adhesive labels on their PET packaging in order to leverage the benefit of labels which enable recycling, and to make sure that claims they make on (enabling) recycling are met.

Recycling-enhancing self-adhesive labels also serve as a key tool for the brands and the designers when having to consider both the need for differentiation and consumer experience as well as design for recycling to meet the upcoming recycling targets that will be most likely implemented by the European Union.

CHALLENGES FOR SELF-ADHESIVE LABEL SUPPLIERS, BRANDS AND RECYCLERS

The self-adhesive label industry has excelled in making commercial scale innovations available to meet the increasing demand of recycling solutions for PET containers.

However, the majority of self-adhesive labels on PET packaging still use permanent adhesives, which have not been designed to be removable from the PET material in the recycling process. These permanent adhesives either remain attached to the PET flakes or float freely in the water attaching themselves to other parts of the process, thus creating issues for the recycling process.

The challenge is here: Labels with a permanent adhesive or labels with a true wash-off adhesive which enable recycling, cannot be visually distinguished from one another. Esthetically both solutions are equal and often have even the same adhesive tack as well as other properties.

Such self-adhesive labels with permanent adhesives are observed to stick to other parts in the recycling systems or remain on the PET flakes, resulting in yield losses or lower quality recycled PET (rPET) as well as equipment downtime etc.

The advantages of the wash-off labels which enable recycling are not truly observed in the recycling systems, as the permanent label adhesives today still hold the major share of the self-adhesive labels used on PET containers. The perception arises that such negative issues are caused by self-adhesive labels in general as the good properties of the wash-off solutions are over-shadowed by the negative permanent ones. Thus the benefits of labels which enable PET recycling remain unnoticed, and are not being observed due to the previously mentioned predominance of permanent adhesives.

This results in a misconception by recyclers and other industry players, that labels which ACTUALLY support and enable PET recycling are not fitting their process.


Using observations from small scale lab evaluation of self-adhesive label solutions to explain the challenges in the recycling systems does not reflect the real industrial scale performance. An industrial or semi-industrial investigation would show the benefits of the wash-off labels which enable PET recycling compared to the use of permanent adhesives.

To ensure the future of circular packaging and to acknowledge the innovations which are already tried and tested and available on the market, we call for full value chain partnership.

RECYCLABILITY BY PLASTIC TYPE AND APPLICATIONS

						
PET	HDPE	PVC	LDPE	PP	PS	OTHER
Water, Carbonates, Salad dressing	Milk jugs, Personal care, Home care	Chemical sprays, Flooring	Plastic bags, General purpose	Food Packaging, Pharmaceutical	Commercial packaging, Styrofoam	Multi-materials, Reusable water bottles
						
Recyclable	Recyclable	Specialty Recycling	Specialty Recycling	Recyclable	Specialty Recycling	Specialty Recycling

Bottle-to-bottle (B2B) recycling is when a material can return back to its original function: PET bottle becomes a PET bottle.



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