SUSTAINABLE TIMES

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Extended producer responsibility (EPR) legislation continues to gain momentum as states deliberate on policies designed to enhance collection, increase recycling rates, and establish end markets for targeted packaging materials. To date, seven states including Maine, Oregon, California, Colorado, Minnesota, Maryland, and Washington have passed legislation, but the covered materials, policies, and timelines established within each state differ. Ultimately, sustainable package design is favored, incentivized by lower fees targeting source reduction, design for recycling, and inclusion of recycled content among the most favored options. Education and awareness about these programs and similar topics are coming in the form of new collaboratives. Enhancements to design guidelines and test regimens to clarify what complies with the new mandates continue as recyclers provide feedback over new material streams.

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COLLABORATIVES

The sustainable packaging pace continues to evolve and the need for more comprehensive education, sharing of resources, and collaboration is increasingly important. The Sustainable Packaging Coalition (SPC) offers many resources for their members around the following topics:

- **Paper Packaging Recyclability Collaborative** - Build industry consensus on paper recyclability test methods and conduct research on the impact of food residue packaging recyclability
- **Packaging EPR Collaborative** - Focus on updating members on the complex legislative landscape evolving in the US.
- **Recovery Technologies Collaborative** - Encouraging and facilitating the use of technologies to increase recovery of packaging materials.
- **PCR Mandates Collaborative** - Development of a tool that helps members tackle the challenges of PCR minimum requirements in US and internationally.
- **Store Drop Off Film Recovery Collaborative** - Provide robust substantiation to be able to issue store drop-off labels, reinforce the validity of store drop off as part of any legal challenges, and add value to industry collaborations to create a new store drop-off directory.

These collaboratives are free to members of the SPC and provide opportunities for exchanging information, hearing presentations by topic leaders, and staying up to date on the hot industry topics.

PAPER LAMINATES FOR FLEXIBLE PACKAGING APPLICATIONS

I am often asked for sustainable packaging options that are compliant with curbside recycling. Currently, paper-based laminations are the only flexible packaging substrates compliant with the mixed paper stream. However, not all paper-based packaging complies and there is specific testing required to claim recyclability. Recyclability evaluations for paper constructions are based upon the **Voluntary Standard for Repulping and Recycling Coated or Treated Corrugated Fiberboard and its Equivalents in the Old Corrugated Containers (OCC) Recycling Stream**, standard developed by the American Forest & Paper Association and Fibre Box Association. This test method designed to assess recyclability of old corrugated containers is also used on alternative paper laminates. The procedure includes two tests, repulpability and recyclability. Repulpability measures the amount of fiber that can be recaptured using a hydropulping process that separates paper fibers from the packaging. The recyclability process assesses the ability of this recovered fiber to be added to the virgin pulp and evaluates its impact on physical properties, color, and the paper making process. Recyclability can

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be claimed if the paper laminate passes both the threshold for repulpability and recyclability. The How2Recycle labeling scheme offers a choice for those desiring to communicate recyclability to the consumers.

Packaging technologists have made progress transitioning traditional packaging laminates to paper options and used this testing regimen to confirm recyclability. As more paper-based flexible options entered the curbside recycle stream, the recyclers noticed that their fiber yield from recycling was lower than expected. The threshold requiring that at least 80% of the fiber could be recovered in the repulping operation did not account for water soluble components and fillers that washed away with the wastewater in the hydropulping process. The paper recyclers deemed this flexible paper stream less desirable as it didn't offer the necessary fiber yields and was less profitable. Feedback was provided to the respective paper associations, and the standard was changed.

In May, an update to the voluntary standard and requirements for both % fiber yield and % rejects were instituted. This change raises the bar for what can be characterized as recyclable in the curbside recycle stream ensuring that compositions of the paper packaging are satisfactory for the recyclers and maintaining end markets for paper-based flexible packaging.

NEW LEGISLATION RESTRICTS USE OF CHASING ARROWS

The use of chasing arrows on packaging had long been used to help recyclers with identification of the packaging composition for proper recycling or disposal. With the launch of sophisticated equipment such as near infra-red sorters now employed at recycling centers, the need for visual identification has been reduced. Even though the symbology was never meant to indicate recyclability, packaging consumers had often mistaken these chasing arrows as recyclable and placed the packaging into the recycling stream causing contamination.

As a result of this consumer confusion, legislation is being employed to restrict the use of chasing arrow symbology. California has strict requirements under SB 343 Truth in Labeling Law regarding the use of recycling symbols on packaging. The law restricts the use of the chasing arrow symbology to those packages which have been deemed widely recyclable across the state. This burden can be challenging to meet for many packaging materials and formats including flexibles. Violation of this law can result in civil penalties.

In today's news (9/26/25) there is an article detailing a *Philadelphia suit for CPGs over plastic bag recyclability claims targeting Bimbo Bakeries' bread bags and SC Johnson Ziploc bags sold in packaging with chasing arrows symbols; city wants companies to revise their marketing, also civil penalties.* This

NEW LEGISLATION RESTRICTS USE OF CHASING ARROWS CONT.

is another prime example where the chasing arrows symbology is creating customer confusion over what can be deemed recyclable.

APC will be working with our customers to notify them of these changes and suggest that they reach out to their legal counsel for support.

ALUMINUM FOIL ALTERNATIVES

The use of aluminum foil in flexible packaging applications is a popular choice as it provides one of the best barriers to water vapor, oxygen, and light, and works well for applications requiring twist retention or deadfold necessary to ensure packaging remains flat when folded. Foil used in flexible packaging applications can be fabricated to calipers as thin as 0.00025 inches which is thinner than a human hair. The term foil is a relative term as it is comprised of different alloys which provide the balance of strength and toughness required for the application. Most foil manufacturing suitable for the flexible packaging market is sourced external to the United States so the tariffs are having a significant impact on the price.

Figure 1: Internal View of a Formed Package Constructed of Foil Laminate Showing Pinholes Created During the Package Forming Process Leading to Loss in Barrier Properties

With all the benefits of foil, there are corresponding disadvantages. The energy required to manufacture foil is one of the highest among all materials used in flexible packaging. The process of mining and refining the ore, smelting the aluminum, rolling and converting it into a thin, high-quality sheet takes considerable resources. Foil is also prone to a loss in barrier properties derived from twisting or folding as this function may create fractures or pinholes. Figure 1 is the inside view of a formed package that is constructed with a layer of foil. During the package forming process, pinholes were created at the bottom corners of the package leading to loss in barrier.

One of the options for foil replacement includes metallized films. Metallized films include traditional flexible packaging materials such as OPP (oriented polypropylene) and PET (polyester) coated with a very thin layer of aluminum. This thin layer of aluminum provides barrier properties that are often satisfactory for the targeted shelf-life needs. Metallized films offer enhanced durability leading to less barrier loss when folded, twisted, or creased versus aluminum foil.

ALUMINUM FOIL ALTERNATIVES CONT

Figure 2 illustrates an example comparing the barrier of aluminum to metallized PET. In this example the barrier was evaluated before and after creasing. The metallized PET exhibited less barrier as a flat sheet but offered the best barrier after creasing as the aluminum foil ended up with small fractures and poorer barrier properties.

Barrier protection is one of the most important considerations for packaging materials ensuring adequate shelf-life. Metallized films offer a viable option that can often replace aluminum foil. It is recommended that shelf-life testing be conducted to confirm that there is no adverse impact to the product contained in the package. APC offers testing such as gelbo-flex which twists the materials at a controlled rate for a controlled number of cycles. Water vapor and oxygen vapor transmission rate can be tested before and after to compare the impact to barrier properties. Additional benefits from changing from aluminum foil to a metallized film include a significant reduction carbon emissions with a ~7x decrease and a much favorable reduction in terms of tariff impact.

		Flat Sample	Creased Sample
Water Vapor Transmission Rate *grams/100in2/day*	Aluminum Foil	<0.001	Up to 0.033
	Metallized PET	0.019	0.019
Oxygen Vapor Transmission Rate *cc/100in2/day*	Aluminum Foil	<0.001	Up to 0.033
	Metallized PET	0.025	0.025

Figure 2: Barrier Properties of Aluminum Foil vs. Metallized PET Illustrating Impact of Creasing and Loss of Barrier Properties

OUR MISSION

Sustainable Times is a quarterly newsletter compiled by American Packaging Corporation that is designed to educate, provide industry highlights and keep you informed of sustainable solutions being developed by APC. If you have any questions, please feel free to contact your sales representative or Jeff Travis at jtravis@americanpackaging.com.