

# Use of reclosures in produce packaging: Adhesive considerations for package designers

## Executive summary

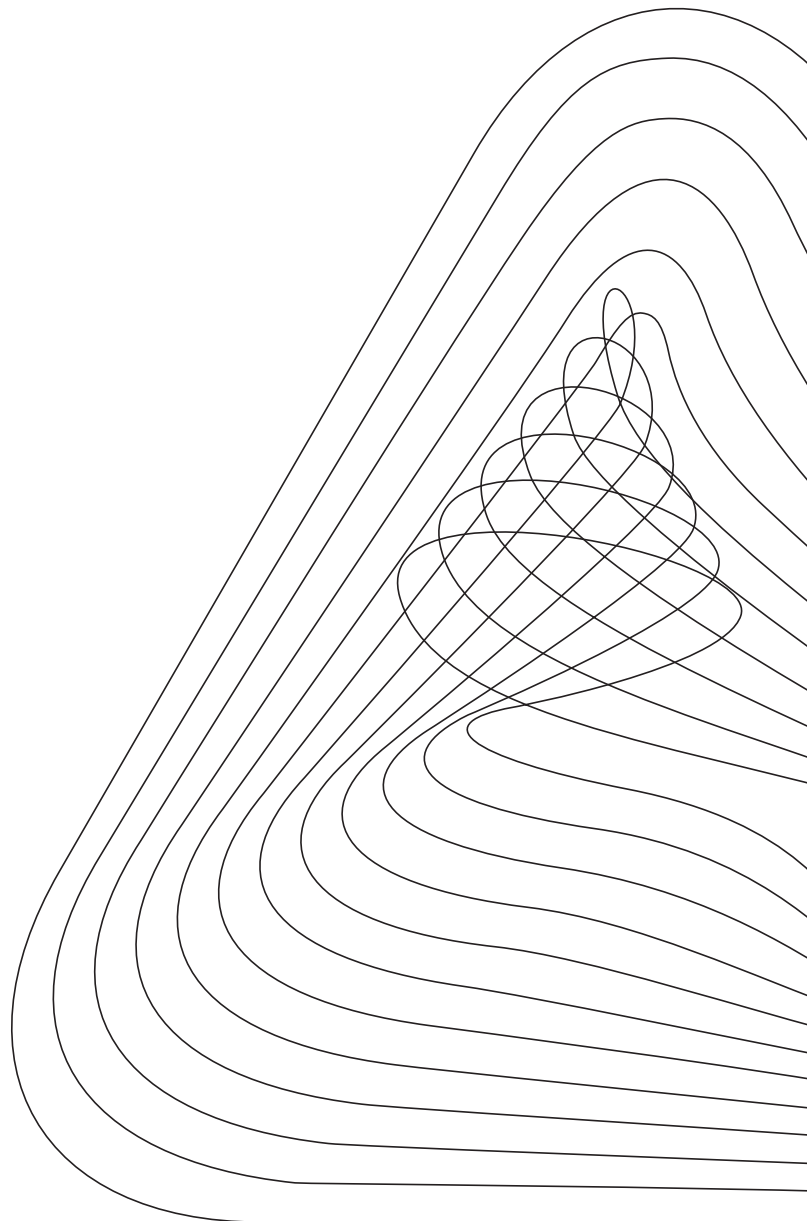
When designing functional packaging with elements such as heat seal films and reclosure adhesives, brand owners and packaging designers should understand how factors such as adhesive peel strength and exposure to moisture may affect their designs. New adhesive and film technologies are available to help them ensure these elements function as intended.

## Functionality and sustainability in packaging design

The original function of packaging is simply to allow for easy transport and storage. In response to new trends and consumer behaviors, however, additional functionality is being added to packaging design. For example, the healthy living macrotrend is resulting in packaging with features that meet consumers' need for convenience, assurance of freshness, and content visibility.

Consumers and brands are also becoming more conscious of sustainability, which, again, is greatly affecting packaging design. A reduction of packaging is a key goal, followed by reuse (for example by incorporating post consumer content), compostability, and recyclability.

One way produce brands are meeting both functionality and sustainability goals is by converting the lid on plastic clamshells to a reclosable film structure. This enables convenience and maintains product visibility, while eliminating up to 40 percent of plastic content.



## New designs, new design challenges

Designing a heat seal reclosure construction, however, may be more than a simple matter of swapping one package element (traditional lid) for another (film and pressure sensitive reclosure adhesive). As basic as the plastic clamshell may seem, it does tend to undergo some unique “stresses” that should influence the choice of adhesive.

When incorporating plastic films and pressure-sensitive reclosure adhesives in such a design, designers should ask these questions.

### What is the peel strength of the reclosure adhesive?

Too strong of an adhesive can cause the following negative effects when the consumer peels back the film to open the container:

- The sides of the tray could collapse inward. This is increasingly likely if the tray’s walls are thin (as part of efforts to reduce plastic content).
- The film could tear in one or more places.

Most traditional pressure-sensitive reclosure adhesives offer a peel strength from PET ranging from 450 – 900 grams per linear inch. Even the lower end of this range is likely too high for many plastic container constructions. Designers thus should specify adhesives that offer a very low peel strength.

### Will the construction be exposed to high moisture?

Moisture release is inherent to produce items, and additional moisture is often introduced during a flash freezing or washing process. Some of this moisture is released prior to packaging. Some, however, will remain and be released afterward. This is especially true for lettuce and other leafy greens, whose curves and overall structure trap more moisture than a smooth, round, produce item.

This moisture will eventually come into contact with the packaging, including the adhesive. It can affect the performance of pressure-sensitive reclosure packaging in the following ways:

- It can break down the cohesion of the adhesive, rendering it ineffective, and possibly leaving bits of adhesive on the product or the consumer’s fingers.
- It can cause the adhesive to turn white. While the adhesive may still be fully functional, this whitening may mar the intended effect of package artwork, and simply be a consumer turn-off.
- It can generate a fogging of the film itself, which reduces the visibility of the product (thus affecting a key consumer benefit).

Packaging designers should take care to specify pressure-sensitive adhesives and films that retain their effectiveness and resist whitening and fogging in high moisture environments. Traditional PSAs may not be optimized for all grocery applications. However, new packaging and adhesive technologies are now available to help designers address these issues.

## How next-generation PSAs are being made for modern grocery/produce packaging applications

Examples of such technologies are included in the Avery Dennison Heat Seal Reclosure Portfolio, introduced in 2018. The Portfolio is aimed primarily at addressing the evolving needs and design challenges of the grocery segment, including these design challenges.

The Portfolio contains five specs featuring four proprietary reclosure adhesives with unique properties. Three of the adhesives – R1350, R1450, and R1490 – are engineered with a slightly-higher initial peel. This helps ensure the reclosure construction remains intact through the rigors of distribution, including stacking. The newest adhesive in the Portfolio, R1350, has an extremely low first peel strength of 110 grams per linear inch, and a feature that gives it 25 times the water whitening resistance of a typical reclosure adhesive. The Portfolio also consists of PET heat seal films with proprietary anti-fogging technology, to help ensure the label construction remains completely clear in high moisture environments.

## Conclusion

Consumer trends and market disruption are pushing grocery packaging design in new and innovative directions. Modern designs respond to consumer needs for convenience, clarity/confidence in a product's freshness, and sustainability through use of less/recyclable materials. Consistent with this trend is the rise in use of heat seal reclosure systems as an evolution beyond the standard two-part plastic clamshell.

Designers, brand owners and other stakeholders need to ensure, however, that the materials used in these constructions are technically appropriate for the application. The presence of moisture — a characteristic of many produce applications, for instance — can impact the functionality and effectiveness of films and pressure sensitive adhesives used in packaging design. Fortunately, new adhesives and film materials have been engineered to deliver the functionality and features that consumers seek.

Spec#	Product Description	1st Peel (g/in)	Adhesive FDA Food Contact	Technical Advantages
79846	Fasson® Clear Print Treated Polyester/R1490/.8M Heat Seal Polyester	690	Direct Food Contact FCN 1716	Microwavable Great water whitening resistance
79904	Fasson® Clear Print Treated Polyester/R1450A/.8M Heat Seal Polyester	460	IndirectFood Contact 21 CFR 175.105	Lower Peel than R1490 Great water whitening resistance
79987	<b>NEW!</b> Fasson® Clear Print Treated Polyester/R1350/1.2M Heat Seal Polyester	110		Low peel and solvent based Great water whitening resistance
79988	<b>NEW!</b> Fasson® Clear Print Treated Polyester/R1350/1.2M Heat Seal Polyester with Anti-Fog	110		Low peel and solvent based Great water whitening resistance Fogging resistance for high moisture applications
79892	Fasson® Clear Print Treated Polyester/R3400/1.2M Heat Seal Polyester	295		Moderate water whitening resistance