



## TIPS & TRICKS FOR THERMOFORMING RIGID POLYESTER FILMS

Every thermoformer has had that bad day when a new material just wouldn't form properly, or seal with full fiber tear, or pass a drop test critical for the final application. While many variables can lead to such outcomes, the frustration, anxiety level, and tempers are always heightened as the delivery date for finished parts comes due. So it is critical that the parameters and expectations for the finished job are well known and communicated up front.

### tip 1:

#### POINT-OF-PURCHASE PACKAGING

#### HOW MUCH REGRIND OR RECYCLED CONTENT IS IDEAL?

The first requirement of the film, once it becomes the package, is that it must highlight the product and not call attention to itself or the product in any negative way, to enhance the point-of-purchase and sale of the product. If the product is lightweight and ends up on the toothbrush or cosmetics aisle, material selection should be driven by clarity, gloss, and sealability. This is an application where the inconsistencies of a very high regrind content or post-consumer recycled-content film would, from time to time, lead to cosmetic blemishes, inconsistent seal, and even impact strength problems.

So an evenly balanced blend of prime and either regrind or recycled content limits the potential contamination and reduced impact strength effects of regrind or recycled content, while boosting the impact and clarity with prime resin. Although improved film performance properties have some added prime resin cost, improved processing consistency and package integrity is achieved while still addressing total package cost imperatives. One example of such a 50/50 blend using post-consumer bottle flake and prime resin is Pentaform® SmartCycle® TH ES150K.



*Radius Toothbrush face-seal blister package  
Pentaform® SmartCycle® TH ES150K film (50% post-  
consumer recycled-content blend with prime APET)*

### tip 2:

#### WHICH POLYESTER GRADES PROVIDE BEST PRODUCT AND PILFERAGE PROTECTION?

Next, the package has to protect the product from breakage through the distribution process, from the packaging line, through the distribution centers and on the retail shelf. And it has to protect the retailer from shrinkage or theft. Consideration for product weight and geometry drive not only the package design, but the selection of a material best suited to accomplish the formability, impact strength, and

seal properties desired. In general terms, prime polyester films are tougher than are those with high regrind or recycled content due to lower heat history. Multiple heat histories in regrind and recycled-content films degrade the polymer chains and impact strength with each heat cycle. It follows that packaging for heavy products will perform more consistently with minimal breakage if prime APET film is selected for this type of product. If a full perimeter RF (radio frequency) seal is desired for improved product and pilferage protection, then a different set of material properties must be considered.

For example, if an RF seal is desired in order to have a completely closed package that cannot be easily defeated or pilfered in-store, then material selection becomes limited, as the RF seal will have a tendency to embrittle the material in the seal area. Consequently, a typical APET material that crystallizes is not an ideal solution when the desired properties demand the softening and fusion of two material layers to form a continuous bond. The ideal choice among polyesters for this application and sealing method is PETG, as it performs RF seals much more consistently than APET. Another more cost-effective option would make use of a hybrid construction, with APET in the core and PETG on the skins. This structure would provide a functional alternative with cost savings versus a prime PETG part, but will have trade-offs on low regrind value. Sometimes called “G-A-G”, examples of this structure can include either prime or post-consumer content APET in the core layer.



### tip 3:

#### **WHAT ARE MY OPTIONS TO ADDRESS CUSTOMERS' PERCEPTIONS OF "SUSTAINABLE PACKAGING MATERIALS" OR REGIONAL PACKAGING LAWS?**

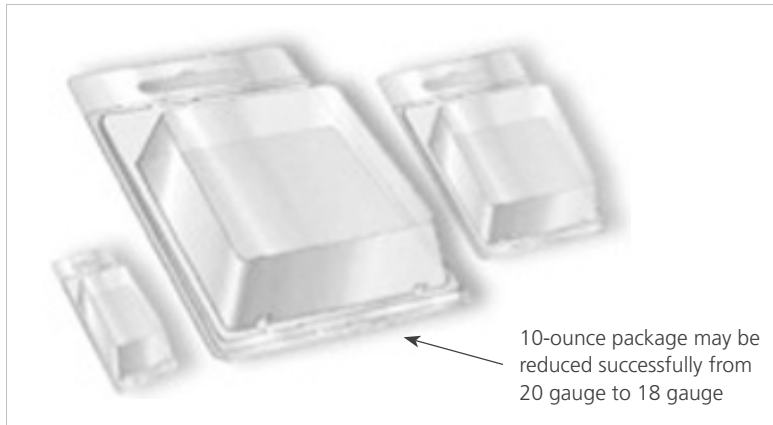
A proactive approach to these customer concerns will almost certainly drive film selection as well as product manufacturer confidence in their packaging supplier. If a packager follows a specific set of broadly accepted guidelines or regulations in their material selection, they will have a credible platform to address customer perceptions and concerns about what types of material they choose for their product packages.

For example, the California Rigid Plastic Packaging Container (RPPC) law mandates “that product manufacturers that sell products held in RPPC’s between 8 ounces and 5 gallons meet one of several compliance options.” For companies using thermoformed packaging, the most common compliance options are 10% source reduction which can be averaged over all packages, or meeting a minimum of 25% post consumer content, which can also be averaged.

The decision to choose one option over the other will be different for every company and every application. The key here is to be sure that proper due diligence is followed and documented while still addressing all package performance requirements. Alignment with a supplier who has reliable thickness control technology can enable 10% down gauging of starting film thickness with minimal loss of total

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package integrity, regardless of polymer selection. Combining downgauging with an overall footprint reduction can potentially minimize the impact on reduced seal flange thickness, minimum wall thickness and overall blister toughness, sufficient for maintaining a fully functional product package. If source reduction is not a viable option for whatever reason, then the selection of minimum 25% post-consumer content APET and GAG performance films provide additional visual packaging compliance options.



*While small clamshells less than 8 oz. do not need to comply with the California RPPC laws, large ones may often successfully comply by down gauging by 10%. This becomes a key consideration if the addition of minimum 25% post-consumer content does not provide sufficient package strength or cosmetics.*

## SUMMARY

In today's global marketplace, all of these factors must be considered in the most cost-effective manner while delivering the value, performance, and cosmetic properties required. Whether selecting a film based on the manufacturer's technological capabilities, such as tight thickness control and state-of-the-art equipment and processes, or on the broad portfolio offered by a film innovation leader like Klöckner Pentaplast, it is important that the specific film manufacturer is committed to and aligned with your company's specific packaging material requirements to help you maximize product sales at the lowest total cost.

When selecting materials and considering the most cost-effective option, remember that the packaging material is your direct distribution link to the consumer. Be sure that your material selection is aligned with all product package requirements to enhance your visual packaging value proposition.

Future topics of TIPS & TRICKS will address:

- Cutting and Trimming Thermoforms – Material and Tooling Considerations
- Down Gauging – Positives and Pitfalls
- Part Design and Material Selection
- Draw Ratios and Draft Angles

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