CHOOSING THE RIGHT MATERIAL

THERMOFORMED PACKAGING APPLICATIONS
Whether serving a new customer, expanding into a different industry, extending a product line or developing novel packaging to achieve a competitive advantage, thermoformers need to choose the right material solution for their application. Although this seems obvious, many factors come into play – and some are not intuitive. In fact, it can be a challenge just to think of all the diverse material requirements for a particular packaging application, let alone identify a material solution that checks all the required boxes. Below are five key considerations when selecting a material for thermoformed packaging applications. Within each is an abbreviated list of examples, although many other potential variables can play a role. In addition, meeting one requirement often affects others – for example, a higher-performance material might impact economics, or the perfect color match could fade or streak at high temperatures. That’s why it’s important to collaborate with a material supplier offering broad knowledge of these criteria, guidance about how they affect each other and suggested strategies for overcoming drawbacks.

**TOP 5 SELECTION CRITERIA**

1. **What are the target markets and applications?**
   Three major markets for thermoformed packaging are food & beverage, healthcare and consumer. Each has specific requirements spanning a wide range of polymer attributes. Further, packaging preferences, standards and regulations vary widely by geography and must be taken into account.

- Food and beverage packaging materials may be required to extend shelf life, withstand high-temperature filling operations and provide high performance in environments ranging from the freezer to the microwave. Material choice and container design are vital to developing a functional product that not only meets specific process requirements but also delivers solutions to effectively meet the end-use application.

- Packaging for medical devices and pharmaceuticals may need to provide protection against degradation from oxygen and moisture, incorporate ergonomic properties such as grip or soft touch to accommodate the needs of healthcare workers or patients, offer high-temperature resistance for sterilization, or minimize extractables to produce a safe package.

- Consumer product packaging material decisions should consider current demands for greater convenience, ease of use and mobility. Smaller, lighter and easily disposable/recyclable packaging supports consumption on the go, as well as environmental awareness. Brand differentiation, particularly for trendy consumer electronics, may require a specialized material solution that facilitates unique package designs and aesthetic effects.
2. What are the performance requirements?
Performance criteria are numerous and varied, ranging from resistance to temperature extremes, abrasion, chemicals and impact, to formability, design and usage properties. Depending upon market requirements and application parameters, the package material may benefit from enhancers including oxygen and moisture absorbers (food packaging), colorants (consumer packaging), clarifying agents (food packaging), surface treatments (consumer packaging) and barrier protection (pharmaceutical and food packaging). Adding to the complexity, the material solution must be evaluated throughout the application’s lifecycle. Exposure to environmental stresses and compression during shipping and warehousing can require additional properties not apparent when considering consumer use.

3. Which regulations and standards are involved?
Depending upon the application, industry and geography, a plastic packaging material may be subject to multiple regulatory requirements and standards. These can be broadly categorized into health and safety requirements, including U.S. Food & Drug Administration (FDA) food contact compliance, Safe Quality Food certification, and United States Pharmacopeia (USP) Class VI standards for quality, purity, strength and consistency of healthcare products; flammability standards such as Underwriters Laboratory (UL) testing; environmental directives such as the European Union’s Restriction of Hazardous Substances (RoHS); and processing guidelines such as Good Manufacturing Practice (GMP). Additional industry and national standards may be applicable.

4. What processes will the product manufacturer use?
A package is designed specifically to protect its contents throughout the supply chain, so it must accommodate the processes used for filling/insertion, sealing, decorating and/or enclosure in secondary or tertiary packaging. The ability of the plastic package to be consistently formed or trimmed with precision is critical to the processability of the package on high-speed equipment. Other considerations include the type of lidding or other closure, the filling method (hot or cold) for foods and beverages and the suitability of the plastic for various types of decoration or labeling.

5. What is the economic proposition for the material?
Cost pressures require thermoformers to carefully evaluate the wide range of polymers available today. Factors such as lower density, stiffness that permits down-gauging and the ability to recycle trim and scrap can make one material a better choice than another. Additionally, some materials offer greater yield, which can have a significant impact on the economic proposition.
One Final Consideration

Material selection for a packaging application – particularly when it involves an unfamiliar market, new design, or highly regulated industry – can be daunting. Choosing the wrong material solution can delay time to market and waste valuable resources. Third-party expertise and specialized capabilities, such as color or design services or regulatory guidance, can simplify this process and give thermoformers a reliable path through the complex maze of plastic options.

What challenges are you facing in creating the ideal packaging solution for your application? Whether its identifying end-use and performance requirements, complying with specific industry regulations or solving processing challenges, the technical experts and innovative design team at PolyOne can assist you in finding a cost-effective solution that addresses all of your needs. To learn more about how we can help, contact us at +1-866-POLYONE (765-9663).