

What Should Decision-Makers Know About Barrier Packaging

Simple Answers to Your Questions about Increasing Product Quality and Improving the Bottom Line

Did you know? All plastic packages permeate gases. The question is only - how much? Testing is the only way to tell before product shipment, and it can vary, from batch to batch and supplier to supplier

How much should management know about barrier packaging?

The knowledge and level of sophistication in the barrier plastic packaging business has skyrocketed since 1983 when a co-extruded multilayer plastic ketchup bottle hit the supermarket shelves. Companies continually work on packaging strategy. The competition is steep and product quality could be the key to market success.

Decision-makers have an increasingly new variety of resins and other materials for package configurations and technologies to evaluate

Barrier packaging applications ranging from ketchup to jelly and medicines to frozen foods need to be tested to realize the optimum package strategy. New areas involving proprietary resins and adhesives continue to evolve. Controlled Atmosphere Packaging (CAP)/Modified Atmosphere Packaging (MAP) approaches, materials and designs are expanding and must be suitable for marketing production. Both material and design must be suitable for marketing, production, and the bottom line.

The strategy to barrier packaging development Select products and services which allow your company to match barrier packaging material selection to product and distribution requirements. The impact of this is to potentially save millions of dollars in material and distribution costs.

MOCON designs customized testing programs and instrumentation to evaluate the barrier quality of packaging materials.

What do I need to know for package testing performed by the lab?

Optimal packaging will lower costs. Testing new materials and applications will increase production efficiencies prior to product introduction. Although the principles of cost effective packaging and distribution have been around for some time, the combination of testing methodology and computer aided support have recently reached the high level of sophistication necessary. This new level can contribute significantly during product development. This potential is now being realized by many companies who are planning strategies around optimal packaging at product launch.

Testing saves on packaging costs by preventing too costly errors:

1. Under-packaging

One of the worst possible scenarios is the launch of a new product without adequate packaging. Permeation of water vapor or oxygen into or out of the package can rob the product of flavor, color, texture, taste, and nutrition. Only through pre-launch testing of the product's package permeability can under-packaging be avoided, especially when working with the multitude of barrier plastics available today. In this case the new product fails, not because it wasn't a good idea, but because it was poorly packaged and had too short of a shelf life.

2. Over-packaging

Typical packaging development involves estimating product needs in terms of protection, matched to a single temperature and humidity condition assumed to be representative for the entire geographic area the product

will be sold, and then choosing materials expected to last for that system. Over packaging is usually done to avoid the potential risks of under packaging. Then as time passes cost reduction programs are implemented to bring costs down. If the proper testing program has been implemented pre-launch, millions of dollars could have been saved in wasted over packaging. And, once the product is a success, it's often impossible to change anything connected with the package design for fear of losing market share.

It is critically important for both the suppliers and end-users of plastic barrier packages to communicate quantitatively about other materials. Testing is the key to that communication

Cost reductions example #1

Cost reductions are indications of the overspending that has occurred. For example, many companies have reduced packaging expenditures in excess of \$1 million per year through redesign of the package. However, a pre-determined approach that takes into account actual product and distribution requirements and quantitatively matches of them to packaging material properties can allow for optimized packaging at the outset.

Please refer to Figure 1, the gray bar represents the original packaging costs and subsequent cost reduced packages. The red bar shows consistency for an optimal package. The savings is the difference in cost of each package times the number of years the package was used. The economic implications can be significant.

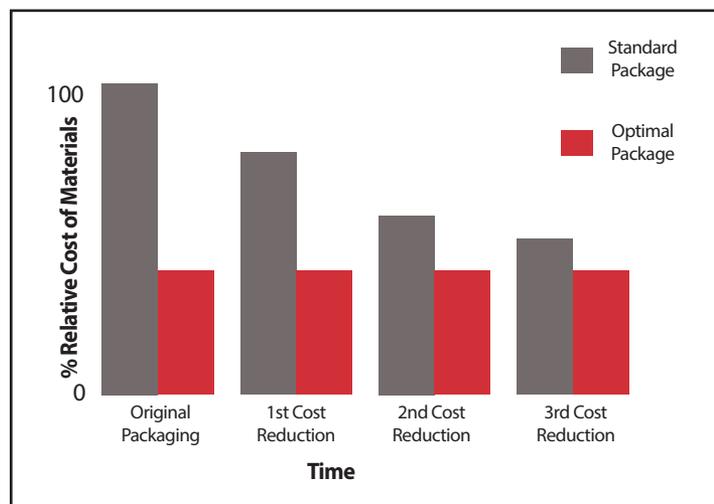


Figure 1.

Save development time

1. Identify product requirements

We work with your people to understand how to develop a package specification. The maximum amount of allowable product degradation must be specified.

2. Measure package protection

Next, protection available from various packaging materials is determined with lab instrumentation or testing services.

3. Determine optimal system

The product requirements and package protection are then matched to either determine the shelf life obtainable in a specific material, or to determine which material will supply a specified shelf life.

4. Fast results

Test results on equipment is available in a matter of hours as compared to storage studies which usually take 4 to 6 months. In addition, storage studies are normally discontinued at a preset time and any protection beyond that time is not evaluated.

We can improve new material evaluation

With so many new barrier packaging materials and resins being made available, it is often difficult to compare permeation data as derived from material suppliers' data sheets. With the proper amount of foresight, a comprehensive materials testing program can be implemented which will enable management to properly select the best barrier material for a particular application. And, there is a great comfort in knowing that the decision is based on the actual test data and not on performance claims from outside the company.

Ensure finished package integrity example #2

Full package testing allows determination of the affects of the plant operations on your package. For example, the glassines used for cereal packaging have excellent barrier properties in flat sheet. The formation of the package, however, tends to crack the wax coating and decrease this barrier. Therefore, the expected protection is not found in the marketplace. Many cereal products have shifted to structures that are less prone to this change. Testing can determine this prior to market entry. Permeation testing is performed on flat sheet and/or full packages after formation. The difference in permeation values shows the machining effect on the barrier material.

Application Note 15-4102

Expand into selective markets example #3

Packaging performance can be studied for different cities and for different times of year. Figure 2 illustrates differences in shelf life for the same product and package in various cities. If you can speed your distribution through Miami, for example, you can reduce your packaging costs countrywide and realize real savings. It is costly to always package for the worst market area and to assume the distribution must be the same for all market areas.

Another option is to use data to identify materials which would be applicable for say Miami, if you wish to alter the packaging for the critical markets. The potential of this approach is also to save costs for the bulk of the US or Worldwide markets. The bottom line is that your packaging can reflect real, rather than theorized, requirements and meet those needs for the most cost-effective packaging.

Finally, we can help to ...

- Decrease packaging costs
- Shorten development time
- Improve new material evaluation
- Measure finished package performance
- Allow expansion into selective markets

We offer alternatives to traditional approaches thereby allowing optimization of the costs of the package/distribution system. By modifying either distribution in critical markets, packaging materials in critical vs. non-critical markets, or both, large savings are possible.

MOCON has a full line of barrier testing instrumentation for all levels of plastic packaging from resin development to films to finished packages. MOCON barrier materials testing instruments and consulting services can provide you with the most cost-effective package for the unique needs of your specific product.

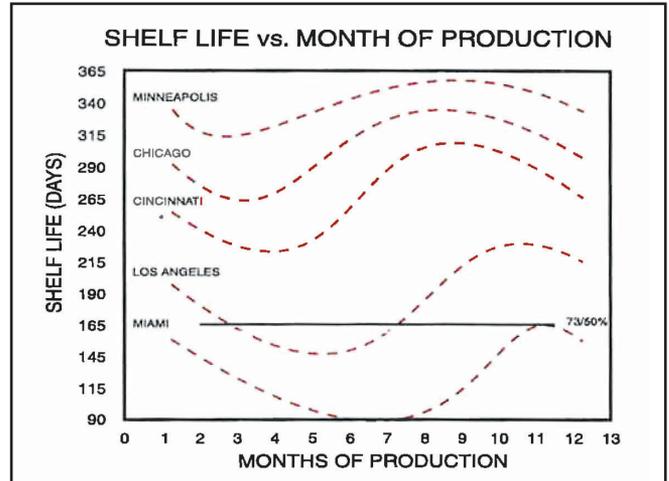


Figure 2. Copyright by Kenneth S. Marsh & Associates. Used with permission.

Minneapolis, MN 55428 USA
Phone 763.493.6370
E-Mail info@mocon.com
www.mocon.com

