

The Future of Barrier Coatings

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The global barrier packaging industry continues to be quite dynamic. Economic pressures, environmental concerns, multiple converting processes, geographic and regulatory requirements, and performance features all influence the barrier coating designs and development. In this presentation, we will explore the industry drivers, needs, practices and future trends of barrier coatings.

Drivers

Two drivers that strongly impact the design of barrier coatings are cost and performance. The financial pressures experienced by packaging companies create great opportunities for cost reduction. Unlike traditional single component materials like polyethylene and wax which influence barrier properties by the amount applied, water-based coatings have nearly an infinite selection of available materials to creatively reduce the applied cost of barrier performance. When it comes to performance, material selection is often more likely to create unique solutions with water-based coatings since they can be highly customized for individual applications. Advances in polymer technology, nanotechnology, bio-based materials, specialty chemicals and formulation techniques are providing barrier coating developers nearly unlimited potential.

Needs

The needs across the industry can be very extensive and complex. This typically relates to performance needs but has recently expanded to include regulatory and compliance requirements. Some of the more popular needs we will explore include:

Water resistance	Food contact compliance
Moisture vapor resistance	Repulpability/recyclability
Abrasion resistance	Customization
Oil & Grease resistance	Release
Heat resistance	Control of surface characteristics
Productivity	Strength retention
Renewable materials	Light weighting

The challenge is not the achieving of any single need but the ability to combine many if not all of these attributes into one coating formula or product.

Practices

When one begins to investigate the various converting processes that can be used to convert paper into barrier packaging, it is quickly realized that coatings will need to be customized to work effectively. Providing barrier performance to packaging before, during and after the converting process requires a firm understanding of how to achieve the needed performance regardless of how it is applied. At times, it may require the use of multiple steps in the manufacturing process to achieve the needed end-use properties. Careful consideration must be given to provide these solutions in a safe and user friendly manner.

Future Trends

There is growing momentum for the use of barrier coatings for paper packaging in virtually all industries. Barrier coatings enable paper to be used in more applications more than any other technology. It is seen in industrial goods including automotive, appliance and electronics industries. Consumer goods, in particular food and food service packaging, has been showing stronger interest in alternatives to traditional technologies as environmental awareness continues to lead the way for various end-uses. Finally, the use of barrier coatings continues to be looked at from revenue generating activities as opposed to merely being considered a cost source.

In conclusion, given the vast array of ways in which paper is used for packaging, from sandwich wraps to paper tubes, from corrugated packaging to folding carton, from multi-layer laminations to paper cups, from molded pulp structures to thermoformed trays, barrier coatings continue to play an integral part of the paper and paper converting industries. Whether these coatings are sprayed, dipped, roll coated, rod coated, gravure/flexo, or applied on a paper machine, the technology continues to be developed and refined to fit the current and future needs. Meeting these challenges while complying with the global regulatory changes are essential to keep paper packaging a viable and growing market.