

Sustainable P.E. film packaging is not an oxymoron



By Mark Lichtblau

As the environmental movement presses onward, the market is demanding more than just sustainable products. People want to know that the packaging in which their goods arrive is sustainable too. This trend has spurred new creativity around what and how materials are being used in polyethylene (P.E.) films.

Because of their resistance to degradation, plastics are often considered counter-intuitive to sustainable packaging, but P.E. film manufacturers are working harder than ever to prove that their product is a sustainable packaging solution (see sidebar). Such measures are found in the manufacturing process—using renewable energy to power operations, for example—as well as in the film itself.

When it comes to the product, there are two major ways in which P.E. film lends itself to sustainable initiatives. The first way is by no means a new concept, but as science and technology improve, down-gauging is becoming easier to achieve effectively. Companies are realizing that in addition to being a money saver, using a thinner film gauge also means consuming significantly less material—sometimes up to 20 percent. By extension, down-gauging also reduces the amount of material that consumers have to dispose of.

The second and arguably more important way that P.E. film is improving is the substitution of typical petroleum-based resins with renewable-resource-based resins, such as sugar cane, corn

stalks, wheat grain and sugar beet. Using these resins, shopping bags and produce bags can be made compostable.

As not to waste existing petroleum-based plastics, manufacturers are also opting to use post-consumer-recycled (PCR) resins in some of their formulations. PCR is a popular choice because it is widely available and easily integrated into many applications.

What about performance?

Once chemical makeup starts changing, customers want to be assured that their packaging will continue to perform the way it was intended. After all, sustainability isn't practical if the product can't deliver results.

The short answer is that sustainable P.E. film doesn't have to suffer in performance whatsoever, as long as it is made with attention to detail. The key is in the multi-layering technique. Instead of using a mono-layered film with one resin, market-leading films are now made with multiple layers of different resins. Each resin layer is optimized to provide a specific function in the film. When combined, 100 percent of the benefits in each layer create a cohesive super-film, as it were.

With down-gauging, the necessary strength, seal and gloss is about using the right formula, not having the bulkiest film. Manufacturers are able to use smaller proportions of high-quality resins to create significantly thinner films, while retaining the same performance specifications.

What exactly is sustainable packaging?

Leaving no room for greenwash, the Virginia-based Sustainable Packaging Coalition (SPC) created a definitive list for the common understanding and vision of what sustainable packaging entails. According to the SPC, sustainable packaging:

- is beneficial, safe and healthy for individuals and communities throughout its life cycle
- is sourced, manufactured, transported, and recycled using renewable energy
- optimizes the use of renewable or recycled source materials
- is manufactured using clean production technologies and best practices
- is made from materials healthy in all probable end of life scenarios
- is physically designed to optimize materials and energy
- is effectively recovered and utilized in biological and/or industrial closed loop cycles
- meets market criteria for both performance and cost

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When it comes to PCR- or renewable-resource-based resins, layering allows for high-performance material to remain on the outside layers, holding sustainable resins in the core. Thus, suppliers are still able to give the customer a clear printing surface and the converter a great layer for sealing. If the resins were blended into one layer, performance would most certainly suffer, as the film wouldn't be able to gain the same attributes.

A work in progress

Sustainable packaging is the way of the future, but it would be remiss to ignore any areas of weakness. One such area is cost. As the prevalence of bioplastics widens, cost should become less of an issue. In the meantime, using sustainable resins will come at a higher price tag. Of course, companies will still reap the benefits of a better offering to the customer, a higher sustainability scorecard and a shinier CSR statement, but monetary savings are a perk that will likely come in time.

In terms of specific uses, companies should know that PCR-based resins are still not recommended for all food applications. While it excels in heavy duty industries and protective packaging, PCR material still has a few issues with odour and ink transference. This matter is something the industry is working to perfect, but plant-based resins will have to be substituted until that happens.

Last, we must consider that everything has a life. If you take the same material and recycle it five times, its properties will become worse and worse every time. There's a general assumption that of the recycled material used in P.E. film, 50 percent is being recycled for the first time and the other 50 percent

is made up of materials in various stages of multi-recycles.

The future is bioplastics

As the industry continues to iron out the kinks, make no mistake that sustainable packaging is here to stay. According to World Bioplastics to 2013, a study from industry research firm The Freedonia Group, global demand for bioplastics will increase more than fourfold in 2013 to more than 992,000 tons.

This study concludes that growth will be fuelled by factors such as consumer demand for more environmentally sustainable products, the development of bio-based feedstocks for commodity plastic resins, and increasing restrictions on the use of non-degradable plastic products, particularly in plastic bags. Most important might be the expected continuation of high crude oil and natural gas prices, which will allow bioplastics to become more cost-competitive with petroleum-based resins.

Right now, more suppliers are designing lines for the recycled material layer in P.E. films. Machines are also being built to re-pelletize a wider range of materials with a lower variance, so manufacturers can use more material for more applications. Sustainable P.E. film is certainly not an oxymoron. To the contrary, it will only get more sustainable, more consistent and more prevalent in time.