

Shrink sleeve resins grow in importance

Choosing the right material for your shrink-sleeve label requires balancing performance, environmental and other factors.

A lot of packagers are finding shrink-sleeve labels are a good fit.

But making that good fit into the best fit requires judicious material selection. Shrink sleeves are one of the fastest-growing options in rigid container labeling. They offer top-notch graphics at a relatively low cost with

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the option of tamper evidence, and they can decorate containers with unusual shapes.

"As far as shrink sleeves in general are concerned, it's got to be one of fastest growing segments of the packaging and container-decorating industry," says Robert White, chief operations officer of film converter Osio International.

Shrink sleeves can support top-notch graphics, including rotogravure printing. Alcoa Packaging recently received a Golden Cylinder award from the Gravure Association of America for the graphics on a 90-ounce bottle of hot chocolate syrup from Nestlé.

Until recently, there have been three major options in shrink-sleeve resins: polyvinyl chloride (PVC), polyethylene terephthalate gly (PETG) and oriented polystyrene (OPS).

Those three still dominate the market. But a relative newcomer has been coming on strong: polylactic acid (PLA), a polymer derived from corn, as opposed to petroleum.

PLA has been around, in film and other forms, for years. But its viability has an alternative for shrink film is relatively recent, due to improvements from both the converting and end-use standpoints.

Easier handling

Theresa Sykes, product development manager of Gilbreth

Packaging Systems, says PLA shrink film was not commercially viable when it came out two years ago. But improvements in machinability have made it easier to handle on the printing press and in end users' shrink tunnels.

The biggest advantage of PLA has to do with its makeup. Unlike petroleum-based resins, it biodegrades when composted. That makes it attractive from an environmental standpoint—a factor that received a big boost with the advent of the "Sustainability Scorecard" now being implemented by Wal-Mart. PLA gets the same score as PETG on this Wal-Mart scorecard—PETG by virtue of being recyclable, and PLA because it's compostable.

This equality troubles Sykes and other converters, because recycling is far more common than composting in municipal waste streams. Not only doesn't PLA fit into recycling streams, it has the potential to mess them up if it's thrown into the mix—and with film, there's no easy way to distinguish among resins.

Operationally, PLA shrink film has certain advantages, according to Sykes. It has an activation temperature of 130° to 140° F., compared with 160° to 180° F. for conventional petroleum-based film. The lower temperature means shrink tunnels that run PLA use less energy and, in many cases, can run significantly faster. In



New resins for shrink-sleeve labels can help decorate even the most contoured containers.



addition, enough PLA is now being produced so that Gilbreth can offer it at a cost about 5% less than PETG.

Not all converters share enthusiasm for PLA film as shrink-sleeve material. Howard Millstein, president of converter Ameri-Seal, says his company can convert PLA film if desired but adds, "Many companies are leery of this newer film because it is not entirely proven to be completely stable. Because of its corn base it is known to have a limited shelf life. In addition, its shrink characteristics are very different that PVC, PET and OPS, which makes it difficult to use on many shaped containers."

Shrink advance

Shrink characteristics—how fast, and at what temperature, the film will shrink—are among the most important aspects of shrink sleeve labels. Improved shrink is a significant advancement in a new kind of label material from Eastman Chemical Company.

One of the biggest potential problems with shrink sleeve labels is unwanted shrinkage. The desired shrinkage is around the container, in what's called the "transverse direction." The problem arises when too much shrinkage occurs in the "machine direction," the direction from which the film flows out of the roll—which, from the container's standpoint, is the up-and-down axis. When this happens, the film can form a wrinkle called a "smile" or a "frown," depending on the orientation.

Shrink-sleeve labels are an economical alternative to direct-print labeling for rigid containers.

Embrace LV, an improved version of Eastman's Embrace PETG resin, is engineered to reduce or eliminate machine-direction shrinkage. In addition, Embrace LV's shrink profile can be custom-engineered to fit a particular container shape. Instead of shrinking up to 5% in the machine (up-and-down) direction, the film actually expands about 1%, greatly reducing the likelihood of smiles and frowns.

Two new PETG films from Klöckner Pentaplast are designed to exhibit low shrink force and low machine-direction shrinkage. Pentaprint E749/22 boasts 75% shrink properties with little or no shrinkage in the machine direction, making it a good choice for highly contoured containers. Pentaprint E749/55 PETG film, for full-body shrink sleeves, has 70% shrink.

Converters say that in general, PVC dominates the shrink-sleeve market, but PETG is coming on strong. PVC's primary appeal is cost: It's the most economical of the major shrink-sleeve resins. It also prints well and has a good shrink rate.

PVC's major drawback is environmental. It's made with chlorine, which can pollute both during fabrication and when incinerated. Also, using a PVC label on a PET container can cause serious recycling problems. It's hard to identify a PVC label as one that should be separated from the container, either visually (because labels

rarely state their resin) or automatically, through water separation (because they have a similar specific gravity). A minuscule amount of PVC can contaminate a batch of PET during recycling.

In fact, Millstein says, PETG has now become the dominant resin for Ameri-Seal, accounting for 70% of its conversions; about eight years ago, PVC had about an 80% share. The biggest advantages of PETG are its high shrink rate and its compatibility with most recycling set-ups.

OPS has less than 10% of the U.S. market; it's much more popular in Asia. It's more economical than PETG and has a smoother shrinkage rate, but it's also unstable and has to be shipped in a refrigerated container, according to Millstein.

All shrink sleeves are not alike. Matching the resin to the application, and taking advantage of the latest technological advances, will ensure the best possible "fit." **F&DP**

For more information

The following companies have helped in the research of this article:

Eastman Chemical Company
423-229-2000;
www.embraceresins.com