

Narrow Web's Leverage

Label printers planning to expand into flexible packaging have the ability to service short-run requests, execute quick changeovers, and manage shorter lead times.

By Randy Parrish, Fasson Roll North America

Innovative labeling and packaging increasingly influences consumers when it comes to in-store purchase decisions. According to the National Retail Federation, Washington, DC, packaging is a key differentiator for consumer goods with an estimated 50%–70% of purchasing decisions being made at the store shelf.

Whether it's a national brand or private label, only seconds count. That's all the time consumers will spend deciding what product to buy. It comes down to enabling consumer product goods (CPG) companies—from national brands to private label—to differentiate their products on store shelves with outstanding brand presence.

Flexible packaging delivers the convenience needed by today's "grab-n-go" lifestyles. Coupled with a broad range of materials and converting properties, flexible packaging creates the recognition brand owners want and consumers trust. In fact, these lightweight, printable, laminated structures offer the versatile and functional packaging that makes them a natural for the narrow web market.

Role of Narrow Web Printer

Product variety, speed to market, and increased demand for short runs are the key drivers behind narrow web opportunities. Narrow web printers can produce smaller quantities



Polyester-faced laminated pouching material can be used for wet goods and liquids.

of flexible packages at very competitive costs, allowing a smaller manufacturer to emulate a larger competitor's packaging and graphics and make a head-to-head challenge for shelf appeal. Samples, new product short runs, tear-off packages, or product personalization for regional distribution are all an ideal fit for today's innovative narrow web converters.

Package Selection

Brand managers are using flexible packaging to revitalize product images. New flavors, eye-catching design, and convenience packaging are adding so much fresh appeal to product lines; stores are using one brand to fill shelf space from top to bottom.

tion control, airtight nutrition bars, drink mixes for water, travel pouches of shampoo and conditioners, nutraceuticals, and even pet food, all can benefit from flexible packaging.

Preserve & Protect

Flexible packaging technology has greatly improved to provide better constructions that can be tailored to meet specific needs of a wide range of packaging and end-use applications. There is also a growing demand for less packaging, like eliminating unit cartons, and flexible packaging is able to meet that need. From new products to line extensions, SKU proliferation is pushing brand owners to increase the speed at which they take products to market. And with it is the call for shorter lead times and smaller runs, all of which can be met by narrow web printers and flexible packaging.

Used by nearly every industry, flexible packaging can protect and preserve products and at the same time meet the growing demand for innovative package design, especially in the retail sector. But while the exterior is designed to showcase the high-end graphics mandatory in today's marketplace, the internal barrier materials prevent foreign substances, gases, odors, or chemicals from entering or exiting the package. And, in some cases, manufacturers are putting more effort into simply repackaging their existing products for convenience, portion control, resealability,

Many factors influence the packaging selection process, and it starts with assessing the needs of the market. It's critical to identify what has to be packaged and its entry point with consumers: private label, single-serve packets, promotional specials, test-market launches, beauty and personal care specialty markets, sample pouches, dry/powdered goods, coffee, specialty and regional foods, etc.

Product variety and line extensions are opportunities for meeting the needs of today's fast-paced lifestyles. Everything from suitcases and lunch boxes to cars and hotel rooms are filled with portable packages. It's all about products that are lightweight, individually wrapped, or resealable. Things like single-serve snacks that provide ease of por-



The iced tea pouch is a paper-faced laminated product. The energy gel product is in a film-faced cosmetic web, and the energy bar is a film-faced snack web material.

and safety, than changing the actual product being packaged.

From easy-to-convert paper-faced pouching materials for powdered ingredients, such as soup or drink mixes, to film-faced pouching products with optimal barrier and sealability characteristics for hard-to-hold wipes and lotions, there is a wide range of flexible packaging products for all markets and every end-use application.

The broad range of available substrates gives narrow-web printers the opportunity to build their own flexible packaging structures. For example, sub-surface printable base stocks and clear laminating films are key components that can be easily mixed and matched to meet varying needs. Base stocks provide barrier and sealant layers with the ability to protect the print using polyethylene terephthalate (PET) or oriented polypropylene (PP) films.

Flexible Packaging Defined

Flexible packaging uses a combination of materials—paper, film, and foil, to provide properties that protect the package contents, be they powder, liquid, or solid. The process of converting raw materials into flexible packaging generally involves two differ-

ent laminating processes—extrusion and adhesive.

Extrusion laminating is a process in which layers of multilayer packaging materials are laminated to each other by extruding a thin layer of molten synthetic resin, like polyethylene (PE), between the layers. This is typically a PET/PE/foil/PE (PPFP) construction used for cosmetic web and stickpack applications. Adhesive laminating is a process in which individual layers of multilayer packaging materials are laminated to each other with an adhesive. Coffee web and snack web are typical applications.

There are three components in a flexible packaging structure. They include the exterior, barrier, and sealant. The exterior layer is the print surface and serves various purposes depending on the product being packaged and the type of packaging machinery. Often the exterior layer is the print surface for a pre-laminated construction.

Barrier materials provide protection and are based on requirements that vary depending on the product being packaged; the desired shelf life; the packaging, storage, and distribution conditions of the final product; as well as other special needs.

The sealant layer is a material that will adhere to itself or to another film when heat and pressure are applied to produce hermetic seals that prevent gases from penetrating through the seals into the package. It is typically applied to the inside layer of a multilayer structure on the side that comes in contact with the product. Among other performance considerations, characteristics of this layer vary depending on the product being packaged and the type and the speed of the packaging machinery.

Paper-Faced Pouch Materials

Paper-faced pouch materials are designed to be surface printed and are used to create fin-sealed flexible packaging pouches. The paper face on these materials is all semi-gloss quality paper or higher. Line copy and process printing can be achieved. The only exception is sugar pack material, which is an uncoated paper.

Pouching of these materials will cause the print surface to see temperatures up to 375 deg F. Therefore, inks and varnishes must be able to withstand these temperatures. Varnishes for the food market must meet end-use FDA requirements.

End-use applications include:

- ▶ **PPFP** | Lightweight packages for dry powders and mixes. They are easy to tear open and have a long shelf life due to a foil barrier.



Single-serve and sample flexible pouches provide convenience, portability, and portion control.

Why Pursue Flexible Packaging?

The market is large.

According to the Flexible Packaging Assn., Linthicum, MD, the total size of the flexible packaging market in 2008 was \$25.6 billion. Of this, 54% went to retail and institutional food, 10% to consumer products, 9% industrial, 9% to retail non-food, 8% to medical and pharmaceutical, 7% to retail poly bag, and 4% for institutional non-food.

Flexible packaging delivers a level of aesthetics and functionality that can fully capitalize on these emerging packaging trends:

- ▶ The increased demand for green packaging calls for reduced materials and biodegradable products. Lighter-weight packages are taking up less space, which translates to significant savings in warehousing and transportation costs, along with contributing to sustainable packaging initiatives.
- ▶ Packaging is valued by consumers and end-users for convenience and product freshness as well as portion control.
- ▶ Mass customization/SKU proliferation seeks to give a broader cross-section of consumer packaged goods that are more tailored to their specific needs: brands targeting smaller population slices, more brands and SKUs to give consumers more choices, and shorter product life cycles.
- ▶ Reducing end-user costs and complexity are accomplished with thinner constructions, product consolidation, and globally available products.

- ▶ **PPFP with DuPont's Surlyn** | Same as above but has a greater ability to seal through light powder contamination in the seal area.
- ▶ **PPMOPP (paper/poly/metallized oriented PP)** | Suitable for applications requiring additional package stiffness and puncture resistance, such as for noodles or rice. A notch is needed to open the pouch and is added to the material during the form/fill/seal (F/F/S) process. Has less barrier characteristics and shorter shelf life than PPFPP due to metallized biaxially oriented PP (BOPP) versus foil sealant. The 35# PPMOPP is used for improved puncture resistance for noodles and large granulated spice packs.

Film-Faced Pouch Materials

Film-faced pouch materials are designed to be surface printed. There are two categories of film-faced pouch materials:

- ▶ Very thin film that contains a single layer or two layers of film laminated together. Applications include pretzels and baseball cards.
- ▶ A multiple film lamination that often contains a barrier layer of foil. Multiple layer laminations utilize similar web tensions as paper-faced pouch materials and are similar to pressure-sensitive material tensions. Applications include shampoos and conditioners.

Heat-resistant film inks are recommended. Post-cure happens with film printing [water-based and ultraviolet (UV)], meaning the ink

will adhere better over time versus off press. Proactively checking and maintaining UV lamps will ensure the material is receiving proper light exposure to promote full ink anchorage.

Lower press speeds are to be expected with films. Longer drying times are required as the inks are not absorbed but instead bond to the film surface. Higher airflow rates in the dryers will help reduce drying times. Because films demand lower heat levels, chill rolls can be used to keep the web temperature low in addition to higher airflow.

As with paper-faced pouch materials, pouching of film-faced materials will cause the print surface to see temperatures up to 375 deg F. Therefore, inks and varnishes must be able to withstand these

temperatures. Varnishes for the food market must meet end-use FDA requirements.

End-use applications include:

- ▶ **Single-Ply Snack Webs** | Horizontal packaging of snacks, baked goods, and ice cream novelties
- ▶ **Multi-Ply Snack Webs** | Nuts and other oxygen-sensitive salted snacks
- ▶ **Stickpacks** | Designed for high-speed, tubular formed, powdered drink mix packets
- ▶ **Coffee Webs** | Coffee, including single-serve and ground coffee packages, but not suitable for coffee beans

Base Stocks & Subsurface Printing

These pouch materials offer an alternative to the paper and film-based pre-laminated constructions listed above.

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With base stocks, the printer has the additional choice to subsurface print by either reverse printing on a clear top ply or directly printing onto the base stock. After printing, the clear top ply is laminated to the base stock using a press-applied lamination adhesive. This process traps the layer of ink between the laminate and base stock, which results in superior graphics protection, improved protection for mouth contact for sport drinks, eliminates the possibility of ink and varnish contamination transferring to the sealant layer when wound into a roll, and eliminates any odor transfer to the sealant side from UV varnishes.

The type of adhesive used in the lamination process dictates the clear, printable top-ply lamination. For example, a 1 mil BOPP works well with a

UV-curable adhesive. The UV adhesive is applied to the face of the base stock material, and then the BOPP is applied to the wet adhesive. The material then passes through a UV light station to cure the adhesive through the BOPP.

A second example is 48-ga PET, which works well with an emulsion adhesive. The adhesive is applied, and then the excess water solvent is dried off through extra long dryers, thereby leaving a live p-s adhesive exposed. The PET is then laminated to the adhesive in a laminating station.

A third lamination process that can be used is called solventless. This process involves a two-part adhesive that is mixed just prior to putting it into the gluepot. Once mixed, the pot life is very short and must be managed closely. A catalyst process begins, and the adhesive

is coated; the clear top ply and base stock are laminated together. There is a post-cure of 24 hr as the adhesive process sets.

Pouching

Each pouch material and specific end-use application has a bearing on the settings necessary for creating a pouch. Heat, pressure, and dwell are the three ingredients necessary to create a good seal for a pouch.

The seal initiation temperature is the melting point of the sealant layer, and the amount of time the seal jaws are closed is defined as dwell. Filling technique, vertical F/F/S or horizontal F/F/S, also affects the settings for creating a pouch.

Flexible packaging offers narrow web converters the opportunity to take their business in a new direction. It allows them to leverage pack-

aging as the primary point of differentiation for brands and to accomplish it with speed and versatility. This combination of capabilities enables CPG companies, as well as contract packagers, to leverage speed-to-market strategies tied to line extensions, which allows them to stay ahead of their competitors.

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Randy Parrish is director, Rapid-Roll Products, Fasson Roll North America, Mentor, OH. He can be reached at 440-534-6127; randy.parrish@averydennison.com.



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