Narrow Web Flexible Packaging Converting

Background

The purpose of this bulletin is to address frequently asked questions from narrow-web converters who are currently printing pressure-sensitive labels and are looking to expand into the flexible packaging market. This bulletin will address specific information around converting pouch materials on press, as well as technical information regarding the form-fill-seal pouching (FFS) process.

Paper-Faced Pouch Materials

These pre-laminated materials are designed to be surface printed and are typically used to package dry goods in flexible packaging. Paper structures are a good introduction product for narrow web converters, as all pouches are surface printed.

Tensions

Due to the thickness and material make up of the pre-laminated paper pouch materials, standard unwind and rewind tensions used for converting pressure-sensitive materials will work well.

Printing & Varnishing

The paper face on the pouch materials are all semi-gloss flexible packaging paper. Line copy as well as process printing can be achieved. However, flexible packaging requires special inks.

Avery Dennison has seen the following ink systems work well for flexible packaging. We recommend you talk to your current supplier, for ink recommendations for flexible packaging.

Inks that have worked well are:

- Zellller Gmelin's Series 34
- Actega's WIT Inks
- Actega's VesaFilm Ink System
- Wycoff's Advanced Film Series
- Alden and Ott's Tempo Grip

The pouching of these materials expose the printed surface to temperatures up to 375°F. Inks and varnishes need to be able to withstand these temperatures. Contact your ink supplier to verify the fit for use.

Many pouches are used for food packaging. Varnishes for the food market need to meet the end-use Food and Drug Administration (FDA) requirements.

These materials are wound in rolls off press with the print surface coming into contact with the sealant material. Inks and varnishes need to be properly cured to avoid damaging the sealability of the material. The odor of the cured inks and varnishes also needs to be considered as the odor can transfer to the sealant film, and ultimately into the finished pouch. An FDA water- based varnish will effectively seal the inks from transferring to the seal area.

Avery Dennison has seen the following varnish systems work well for flexible packaging. We recommend you talk to your current supplier, and communicate you are working in the flexible packaging market. Your current supplier can recommend varnishes for this process.

Varnishes that have worked well are:

- Actega's Radcure Systems
- Actega's RVG001212
- Sun Chemical's QMKSV0484934
- Alden and Ott's Flex Pack Varnish

Finishing

The printed roll off press goes through a FFS machine for forming, die-cutting and filling to create the final pouch. The finished roll contains the front and back of the printed pouch – often produced with many up across the web.

End Use Applications

- **PPFP (paper/poly/foil/poly)** – Lightweight packages such as dry powders and mixes featuring easy tear open and long shelf life due to foil barrier.
- **PPFP w/Surlyn®** – Same as above but with a greater ability to seal through light powder contamination in the seal area.
- **PPMOPP (paper/poly/metallized polypropylene)** – For applications requiring additional package stiffness and puncture resistance such as noodles or rice. Notch needed to open pouch is added during the FFS process. PPMOPP has less barrier and shorter shelf life than PPFP due to metallized BOPP versus foil sealant and 35# PPMOPP is used for improved puncture resistance for noodles and large granulated spice packs. MOPP provides a good moisture barrier.

Film-Faced Pouch Materials

These pre-laminated materials are designed to be surface printed and are typically used to package dry goods in flexible packaging. Film structures carry a variety of chemical resistance and barrier properties due to the diversity of applications for packages with film facestocks. For these reasons, the product offering in film-faced structures is more complex.

Tensions

There are two categories of film-faced pouch materials.

- A multiple film lamination that often contains a barrier layer of foil. The multiple layer laminations utilize similar web tensions as paper-face pouch materials and similar to pressure-sensitive material tensions.
- A very thin film that contains a single or two layers of film laminated together. The thin film laminations require a press designed specifically to convert these materials and would include the following requirements:
  - Better level of tension control vs. pressure-sensitive presses required
  - Low tension unwinds 1 mil film = 1/2 PLI setting
  - Web path designed for extensible materials
  - Idlers rollers and bearings – low friction, easy turning
  - High air flow/low heat air dryers
  - Proper roll handling
  - Cold UV light system/chill roll or chill drum

Printing Ink Recommendations

- Heat resistant film inks are recommended. This can be more expensive than paper inks due to resins used.
- Post-cure happens with film printing (water based and UV), meaning the ink will adhere better over time versus off-press.
- Proactively checking and maintaining UV lamps is recommended to ensure the material is receiving proper light exposure to promote full ink anchorage.
- Expect lower press speeds with films. Longer drying times are required as the inks are not absorbed, rather “bonded” to the film’s surface.
- Higher airflow rates in the dryers will help reduce drying times.
- Films demand lower heat levels, as excessive heat will cause them to soften or stretch; chill rolls can be used to keep the web temperature low in addition to higher air flow.

Varnishing

The pouching of these materials will expose print surface to temperatures up to 375° F. Inks and varnishes need to be able to withstand these temperatures. Contact your ink supplier to verify the fit for use.

Many pouches are used for food packaging. Varnishes for the food market need to meet the end-use FDA requirements.

These materials are wound in rolls off press with the print surface coming into contact with the sealant material. Inks and varnishes need to be properly cured to avoid damaging the sealability of the material. The odor of the cured inks and varnishes also needs to be considered as the odor can transfer to the sealant film and ultimately into the finished pouch.

Overlaminating

For applications where 'buried' print is required, an overlaminate can be applied to film structures. Common practice is to use a 'same film' overlaminate as your printing surface. This allows for like performance on packaging equipment.

Adding an overlaminate may require packaging equipment to run at higher temperatures and therefore a destructible bond is required between the overlaminate and the base film structure. It is highly recommended that the overlaminate is designed for flexible packaging applications.

There are two means of applying a flexible packaging overlaminate:

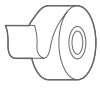
- A self-wound thin PET laminate can be applied on press similar to using an overlaminate on a label. Special handling on press of this overlam may be required due to aggressive adhesive and thin film.
- A wet adhesive laminate using UV lamps for curing is a process requiring UV lamps to be in premier state, with curing time for the structure between 24 and 72 hours. A destructible bond is required for packaging equipment.

Finishing

The printed roll off press goes through a FFS for forming, die-cutting and filling to create the final pouch. The finished roll contains the front and back of the printed pouch, often many up across the web.

End Use Applications

- **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 as well as liquids, primarily VFFS filings.



- **Coffee Web** – Coffee including single serve and ground coffee packages. Not suitable for coffee beans.
- **Cosmetic Web Family** – Dry and liquid goods for food and personal care. A variety of sealants and chemical resistant barriers are available.
- **Stickpak Family** – Varied sealants and face stocks allow for wet and dry goods designed to form and flow in multi-lane stickpak equipment.
- **ChemControl Family** – 'NEW' structures designed to provide superior chemical resistance and barrier properties. These laminations offer alternatives to barex packaging and new "hard-to-hold" opportunities for the narrow web converter.

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 amount of time the seal jaws are closed is defined as dwell. The amount of time is adjustable on most FFS machines and is a tool to ensure the correct temperature is obtained on the sealant film.
- Starting points for each criteria can be found in our Fasson® Rapid-Roll® FlexPak™ matrix
- An example would be Cosmetic Web 350 HB which is listed as 350°F/.5 sec./40PSI which implies this material will seal best when the sealant layer achieves a temperature of 350° F and that temperature is maintained for a half second with the seal jaws applying 40 pounds of pressure to the seal area.
- The seal initiation temperature is the melting point of the sealant layer. This minimum temperature must be reached at the seal film in order to get a good seal. A thicker pouch material will require a higher heat, pressure and longer dwell to ensure the correct temperature makes it all the way down to the sealant film.
- The amount of pressure applied between the seal jaws is also a critical adjustment to ensure the material is held in place without wrinkling until the heat is driven into the seal area.
- It is important when sealing issues arise that all three characteristics are adjusted during trouble shooting to uncover root cause.

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