Take Another Look at Laminating Films

Lamination remains a viable profit center.

By Ken Mergentime

Laminating films are better than ever, and opportunities to make money by laminating should not be overlooked.

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When one first considers adding lamination to the list of shop offerings, the concept seems appealing and simple enough. Shops can make more money from their prints if they laminate and finish them in-house. Taking a closer look, one quickly realizes that there's a lot to know about laminating — what with hot films, cold films, cast and calendered films, solvent and water-based adhesives, and more. Then there's the actual laminating that must be mastered.

But wading in past that first confrontational set of knowledge barriers is well worth the effort. Products are better than ever and opportunities to make money by laminating should not be overlooked.

"Finishing as a whole, I think, is underappreciated by print-for-pay providers," says Albert Boese, executive director of the Post Print Manufacturers Association (PPMA). "On the other hand, clients overwhelmingly expect their prints finished. So print providers need to take note of that and see the added value that finishing provides."

For Boese, finishing is essential. "In my opinion, philosophically speaking, a print by itself has no real value outside of the intrinsic aesthetic value of the graphic content," he says. "A print must be converted into something useful for it to have real value. It must be mounted, framed and integrated as a component of a larger scene, say a tradeshow exhibit..."

And that's why so many shops are mak-

It's important to keep proper laminator tension on films, especially when working with thinner laminates.

ing finishing options a regular part of the sale. "I tell you, there's lots of money to be made there," says Boese.

BACK TO BASICS

Looking at some lamination film basics, films come in a variety of grades, and each is well-suited for various applications. Adhesives on lamination films fall into a few basic categories as well, each with its own set of advantages and drawbacks.

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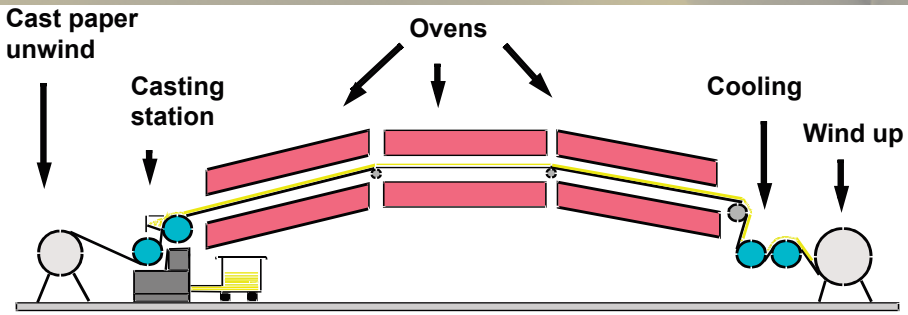
Thermal films feature high-heat adhesives that are activated at 230° to 290° F. These polyethylene adhesives, often referred to as co-polymer adhesives, are usually the least expensive option for laminating films, partly because no release liner is required, though they often fail to provide adhesive "bite" with certain media and inks. For instance, vinyl is not compatible with thermal adhesives because of the extreme levels of heat involved. Some thermal films feature low-melt adhesives made of polyethylene, which are activated around 185° - 220° F. Thermal films are intended for indoor or short-term outdoor use.

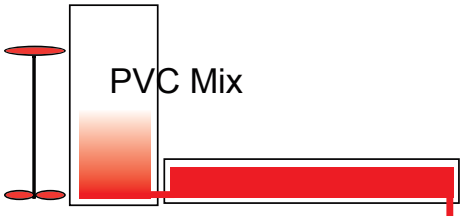
Cold films use a pressure-sensitive adhesive and are therefore often called PSA

With films on the market using thermal, heat-assist and PSA adhesives, it's best to have a laminator that offers both heat and pressure options. (Image courtesy AGL)

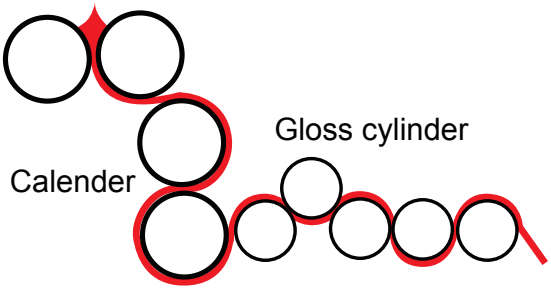
Tradeshow graphics are viewed as one of the most profitable niches in today's market. Matte-finish laminates are often used on tradeshow graphics to offset the glare on the floor.

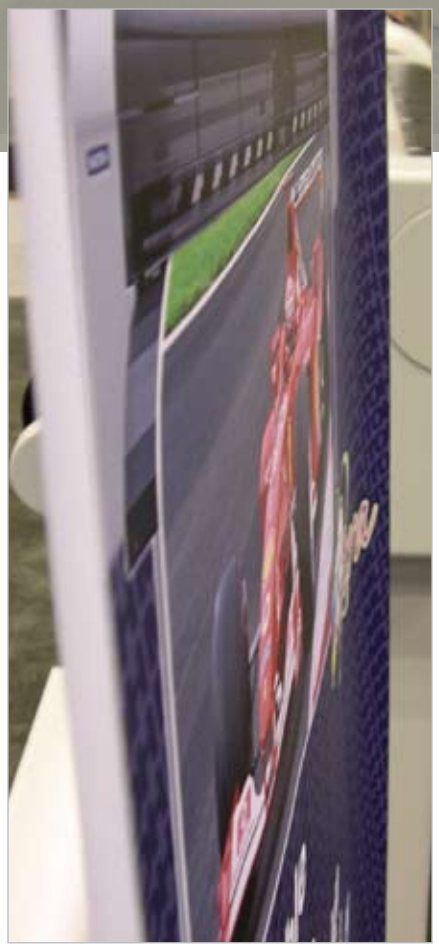


Cast films are made from a liquid mixture that is poured or "cast" into forms on a moving web that pass under a heaters. (Illustration courtesy Avery)



Calendered film is made from a molten mass of vinyl that is pulled through a series of heated rollers and made thinner and thinner until the desired thickness is achieved. (Illustration courtesy Avery)





Curling can be caused by a number of factors, including mis-matched laminate and graphic materials, over-stretching films, and laminating only one side of a free-standing graphic.

films. These require a release liner, but only pressure is needed to activate the adhesive. They are easy to use, bond to almost anything, and work well outdoors. They are, however, more expensive than thermal films. The PSA adhesives are generally made of acrylics, for clarity, and are available in two basic types: solvent-based for long-term outdoor durability, and aqueous or water-based, traditionally used for indoor applications, though recent improved formulations make them more viable for outdoor. Use of aqueous acrylics are growing due to improved performance and environmental considerations.

Heat-assist films use an adhesive that is a cross between thermal and PSA adhesives, though they are still considered PSA films. They also require a release liner, but adhesives are activated at a low 170 degrees and have much more aggressive bonding power than other thermals. "They tend to be less expensive than pressure-sensitive films," says Tom Snooks, field support manager for GBC. "Also, they are more responsive to low heat than a straight PSA film. Heat-assist films are mostly used to laminate over vinyl where silvering is an issue." Silvering is incomplete lamination resulting in color shift.

FILM MATERIALS

Laminating film bases can be made from various materials as well. Keep in mind that different film materials shrink and react to weather differently, so a good rule of thumb is to always laminate like materials over like materials. Here is a very brief rundown of some of the more common materials and their properties.

Polyester is commonly used in high-heat thermal films because it is very heat stable, but it does not offer a UV barrier. These films are flexible when hot, but stiffen when they cool, especially the thicker versions. Polyester is ideal for laminating rigid panels, but not a good choice for vehicle wraps or any application where curves are needed.

Polypropylene is a low-cost film with good clarity, and is generally used with thermal laminates. It is a common base for low-melt adhesives and is not quite as stable under heat as polyester, and therefore more difficult to use. "Polypropylene can be a very profitable film to use in certain conditions," says Snooks. "It's quite inexpensive and can be very effective for short-term indoor applications such as retail graphics."

Polycarbonate film can be considered premium in the PSA world. It is extremely durable and exhibits apparent scuff-resistance in textured versions. It is often sold in heavy grades and is a good choice for laminating floor graphics.

Vinyl costs a bit more than other film materials, mainly because of the costlier PSA adhesives used and the cost of the release liner. It is the only choice for laminating over a vinyl print. Vinyl is fairly heat-resistant and dimensionally stable.

Lamination Film Resource List

Company	Lamination Film Products	Web site
3M Graphics Market Center	Wide range of Scotchcal brand PSA cast/calendered overlam films/adhesives	*www.3m.com/graphics*
AGL	Wide range of thermal and heat-assist overlam films, mounting adhesives and backing films	*www.aglinc.com*
Arlon	Wide range of cast/calendered overlam films	*www.arlon.com*
Avery Dennison	Wide range of DOL brand PSA cast/calendared overlam films, plus DOL 4500 perforated window film overlam	*www.averygraphics.com*
Clear Focus Imaging	CurvaLam brand cast PVC overlam for window graphics	*www.clearfocus.com*
Coda	Thermapro brand low-melt thermal overlam films, Cold-Mount brand PSA overlam films	*www.codamount.com*
D&K Group	Thermal, heat-assist and PSA overlam films	*www.dkgroup.com*
Dr Graphix	Range of PSA overlam films, mounting adhesives	*www.drgraphix.com*
Drytac	Wide range of PSA cast/calendered and heat-activated vinyl, Tedlar- and poly-based overlam films, mounting adhesives	*www.drytac.com*
GBC	Wide range of cast/calendered PSA, thermal and low-melt laminates, coatings and adhesives	*www.gbcconnect.com*
Gerber	15" punched overlam films for Gerber Edge, un-punched cast overlam films	*www.gspinc.com*
General Formulations	Range of PSA overlam films	*www.generalformulations.com*
Graphic Materials Intl.	Range of vinyl and poly-based overlam films	*www.gmintl.com*
Graphic Laminating	Range of PSA, thermal and low-melt overlam films	*www.graphiclaminating.com*
KAPCO	Range of PSA, thermal, low-melt and heat-assist overlam films	*www.kapco.com*
LexJet	Range of PSA overlam films, mounting adhesives, PreLume	*www.lexjet.com*
LG Chem	Vizuon brand cast/calendered PSA overlam films	*www.interiorlg.com*
Milano Digital	Range of PSA (incl. superwide) and thermal overlam films, mounting adhesives	*www.milanoinc.com*
Neschen Americas	Wide range of PSA cast/calendered vinyl, Tedlar- and poly-based overlam films, PSA adhesives	*www.neschenbrands.com*
Oracal	Wide range of Oraguard brand PSA cast/calendered overlam films/adhesives	*www.oracal.com*
Quality Media & Laminating	Wide range of PSA, thermal and heat-set overlam films, backer films, heat-activated adhesives	*www.qmls.com*
Remington Laminations	Wide range of Remi brand PSA, thermal overlam films, mounting adhesives	*www.remingtonlaminations.com*
R-Tape	Polyester and propylene overlam films	*www.rtape.com*
Tape Technologies	Vinyl cast overlam films	*www.tapetechnologies.com*
Universal Products	Cast/calendered and polycarbonate overlam films	*www.u-p.com*

CAST VS. CALENDERED

Vinyl comes in two varieties: cast or calendered.

Cast film (also called "premium", "extended life" or "2-mil film") is made from a liquid mixture that is poured or "cast" into forms on a moving web that passes under a heater where solvents are dried off. The remaining materials are fused together by heat and become a film. As a rule, cast film is made from high-grade materials, is thin, dimensionally stable, highly durable and highly conformable; but comes at a premium price. Cast vinyl films are ideal for outdoor applications, and applications that may require stretching over compound curves such as vehicle wraps.

Calendered film (also called "intermediate film", "medium-life film" or "4-mil film") is made from a molten mass of vinyl that is pulled through a series of heated rollers and made thinner and thinner until the desired thickness is achieved. Calendered film costs less, but is also thicker, less dimensionally stable, less conformable and less durable than cast. Some calendered films are better than others, depending on the quality of the plasticizers used. Better plasticizers result in a more stable, pliable film. Calendered vinyl film is ideal for short-term indoor applications and applications onto flat surfaces.

SHOW ME THE MONEY

Industry observers note that prices of PSA films have come down over the last few years, and their ease of use has helped them grow in popularity.

Others take issue with PSA films because of the release liner. "The liner is simply a carrier that is disposed of during the lamination process," says Boese. "It can be seen as a waste of paper, coating and energy. Thermal films, when appropriate, avoid this waste."

Still, many consider PSA films to be a "universal" solution for most applications. "If you're looking for general all-purpose laminate, then PSA is the way to go," says

TIP SHEET

Here are some practical laminating tips.

- "When encapsulating a flexible substrate with laminates, you should always use like materials and like adhesives on both front and back. If you try to realize cost savings by using a different material or adhesive on one side, then you'll often get curling. Flatness is affected because different materials react differently to heat, cold and other factors. Keep materials the same on both sides." — Al Boese, PPMA
- "In the past, people said that you shouldn't use water-based adhesives to laminate for outside applications because the adhesives would get cloudy from moisture getting between the layers. But that's just not the case anymore. Water-based adhesives have come a long a way over the last few years. In most cases, water-based adhesives perform as well or better than solvent-based adhesives. Water-based laminates today can stand in water all day and you'll never see whitening." — Angie Mohni, Neschen Americas
- "Don't use a PSA film to laminate a photo-gloss print. PSA's often don't stick well to photo-gloss papers. If you need a laminated print with a glossy finish, it's better to print onto a less expensive paper and use a quality glossy laminate. Let the laminate be the finish. If you must laminate a photo gloss print, it's better to use a thermal or heat-assist laminate." — Tom Snooks, GBC
- "Silvering is a common problem when laminating. Here, hot films have a slight advantage over cold films. With thermal and heat-assist films, the warmed adhesive is so soft that it easily moulds itself into all those areas. With cold films, silvering can occur, but usually goes away in a few days once the adhesive has a chance to 'wet out' or settle into all those tiny areas. Still, a lot of guys will deal with silvering on PSA films by cranking up the brake tension on the laminator. And it works — but it also overstretches the film and will almost always result in curling. The best solution, if a hot film isn't appropriate, is to use a heat-assist film. Or, you can simply run your PSA film through the laminator at a very low heat setting. A little warmth will soften the adhesive enough to prevent silvering and no extra tension is needed. — Molly Waters, Avery Dennison

Angie Mohni, VP of marketing for Neschen Americas. At the end of the day, the idea is to make money from laminating efforts. The choice of film material should be matched with the application at hand. And, according to Mohni, some of the highest-profit lamination applications today are for tradeshow, window, floor and vehicle graphics.

"A growing number of shops are looking into tradeshow graphics ," Mohni says. "Shop owners are realizing they can use their solvent-based printers to print onto substrates other than vinyl." Tradeshow graphics are very profitable because, generally they are for short-term use and clients require a fresh set of graphics for every show they attend. Film laminates with a matte finish are often used for tradeshow graphics to offset glare.

Many shops have gone the liquid laminate route for vehicle graphics, but when it comes to film laminates, choices for success (and profit) will depend on the type of vehicle graphic involved.

According to Molly Waters, technical services manager for Avery Graphics, "a complete wrap will always require a cast laminate. On a flat-side truck panel with no rivets, or a bus panel, you can use a less-expensive calendered vinyl."

Laminating window perf for vehicle graphics has always been something of a challenge. Vehicle wrap shops that use liquid laminates have not had luck trying to use that material on window perf. And typical PSA film makes for a cloudy view from within the vehicle. The best option is to use a PSA laminate with an optically clear adhesive.

But an optically clear adhesive isn't always enough, says Waters. "If the backing film has any texture to it at all, the portions that are over the window perforations will still appear to be cloudy. You need a perfectly smooth liner, like a polyester liner that leaves a perfectly smooth surface when pulled away. Then the optically clear adhesive remains optically clear."

MATCHING ISSUES

With so many film and adhesive options, it's easy to get into trouble by laminating a print with the wrong film. Experts agree that the best rule of thumb is to match the laminate film with the graphic film — polypropylene over polypropylene, vinyl over vinyl. The materials must be compatible, because each behaves differently under different weather conditions. They expand and contract at different rates during temperature shifts, and the result of a mismatch can be disastrous. But what about cast vs. calendered films?

According to Waters "the general rule is that you match the laminate material with the printed material. Cast over cast and calendered over calendered — especially with vehicle graphics.

"However, every rule has its exception," Waters adds. "You can certainly use a cast laminate over a calendered substrate and you won't have any problems, but never the other way around." DG