ARLON

TECHNICAL TIP #31

Digital Printing: Graphic Protection

- Film Overlaminates
- Clear Coating
- Application Tape

Unlike screen printed graphics with their high abrasion resistance, good color fastness and strong water resistance, images produced with digital inks are somewhat more sensitive to exterior wear and benefit greatly from added protection. The protection may be in the form of a clear solid film overlaminate or a liquid topcoat. While the added cost of each method of protection is high, the price of not over laminating is far greater. Installation labor savings due to ease, speed and scrap reduction alone is enough to overcome the cost of whichever laminating method one chooses. Beyond that the need to constantly reposition and heat film prior to attachment to the vehicle requires the extra body of an overlaminate. All permanent overlaminates offer the extra measure of UV resistance that digital inks need to be thought of as permanent prints.

Solid Film Overlaminate Systems – Pressure Sensitive or Heat Activated

While many of the early digital print houses used heat activated film to protect graphics they were restricted to short term, indoor installations or flat applications. As digital graphics moved outdoors and onto cars, boat, busses and planes the need for more flexibility, stronger bond and longer life had many end users switching to different strategies for graphic protection. Most lamination films for protecting vinyl graphics are now pressure sensitive products that are bonded to the prints via lamination at room temperature. The values many end-users see with this system as compared to either heat activated film or liquid coating is simplicity, paired components (most digital film suppliers also carry a matched clear laminate of the same grade) and consistent results. Arlon and other suppliers recommend matching laminating film to printing film, i.e. Arlon Cast printing film (DPF 6000XRP) with Arlon Cast overlaminate (Series 3220). Overlaminating films are derived from Clear films for other uses but contain far more UV stabilizers. Some suppliers offer optically clear overlaminate for use on perforated window graphics as well as the standard product for use on opaque applications. Recent improvements in vinyl product clarity will pave the way for its use, rather than the previously preferred polyester, on window graphics where some curvature is required.

Liquid Laminates

Coating a liquid clear over printed film can offer certain advantages that solid film laminates cannot and likewise suffer weaknesses that are difficult for installers to overcome at the time of application.

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Liquid Laminates (Continued)

When using liquid overcoating as the method for extending the life of a print one must accept that variation in coating thickness will occur and that it is coating thickness that determines how much UV protection is offered to the print and film beneath. The best insurance is to buy a high quality roller coater and to keep both top and bottom rollers very clean. An alternative topcoating method is to spray. For those without a coater another alternative is a low-pressure spray unit. In order to use a spray system one must spend time and effort to modify ink viscosity for best spray and leveling characteristic. Most top coats are now water based and do not have a negative affect on softness of film. In some cases they do increase shrinkage and have been known to develop haziness or craze and crack where vinyl is highly distorted during installation. Liquid laminates also require the use of an application paper or film during installation to give the graphic needed rigidity, and prevent excessive stretch during application.

Application Tape

Digital Graphics; especially car wraps don't use as much application tape (paper or film) as more traditional methods of installation such as screen printing or cut graphics. However installers interested in speed and worried about registration precision find that using low tack application paper gives them an edge.

Used in this way the application paper remains with the graphics until the majority of the work is done. As the project begins to cover corners and other dimensional obstacles, which call for greater distortion, of the graphic then the paper is removed and the remaining installation is done using only the graphic/overlaminate combination.

A Word on Automatic Laminators

Automatic laminators work to exert moderate pressure on two incoming layers of film passing between two rotating soft rubber rollers. The tension of the clear film reduces bagginess and allows bubble free lamination and should be just taut but not stretched. Often those operating the laminator continue to add web tension to compensate for misaligned or uneven laminator which develops wrinkles and or bubbles. As the upper layer is the clear vinyl overlaminate and has been previously stripped of its release liner this film is very sensitive to being stretched and can easily be stretched as much as ten percent before the machine shows any sign of laboring. If the clear layer is stretched at lamination it will be easily noticed as the laminated graphic exits the laminator by curling. At this point every step in the process will proceed with difficulty and the finished product will likely fail due to excessive shrinkage and popping away from channels. Great care should be taken to assure that nip pressure is even across the web and that the graphic was trimmed perfectly square to the long edges of the two incoming sheets.

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