

ADHESIVE MANAGEMENT: A SURVIVAL GUIDE

Adhesive management is a principle in graphics application.

It refers to the intentional control of when, where, and how much adhesive is exposed during installation to maximize repositionability, increase efficiency, minimize defects, and ensure long-term adhesion.

THINK OF ADHESIVE LIKE A DIMMER SWITCH, NOT AN ON/OFF BUTTON.

Low engagement means it is easy to slide and/or reposition. High engagement means that the adhesive is locked in, set, and on its way to permanent bond.

Adhesive management is simply about controlling that transition. However, there are several factors surrounding the adhesive that may aid or hinder the application process.

Outgassing for Solvent Prints

Environmental regulations and higher demand for production throughput has accelerated the improvements in solvent print technology. However, sufficient and proper outgassing is still an essential step when it comes to graphics printed with solvent inks.

If a solvent-printed film is not sufficiently outgassed, solvents will remain trapped in the facestock and adhesive. These solvents soften both the film and adhesive, which greatly increases the tack level while weakening long-term adhesive performance.

This is why most installers experience the following:

- ▶ Excessive aggressiveness or pre-tack during vehicle installation
- ▶ Reduced repositionability or more effort is required to snap up the film
- ▶ Pre-stretching or higher risk of over-stretching
- ▶ Less efficient air egress system, hence trapping more air bubbles
- ▶ Lifting on deep channels or wall textures
- ▶ Reduced long term adhesion

While outgassing times will vary depending on ink load, environment, and material, our standard recommendation is to outgas the prints at least overnight prior to lamination.





OVERLAMINATE SELECTION

Overlaminates do not simply vary in class (i.e. cast or calendered), finish (i.e. gloss, matte, or satin), or base resin (i.e. PVC or TPU). They also vary in thickness and inherent stiffness. Therefore, there is no single “one-size-fits-all” laminate solution. The best laminate depends on:

A. Application type (walls, vehicles, or general signage)

For flat wall applications, satin is the most preferred finish to cut down on glare and to “flatten” minor textures on the wall. Also, a thicker or stiffer laminate is recommended. Series 3220 is a 2-mil cast overlaminate that provides stability and structure for multi-panel wall graphics. But if you need additional stiffness, Series 3270 would be another good option.

For vehicle applications, a thinner laminate—1.3 mils instead of 2 mils—such as Series 3210 or Series 3170, enhances conformability and allows the film to better adapt to curves and contours. However, a 2-mil cast laminate is recommended for highly saturated solvent prints, or the installation environment is on the warmer side.

B. Ink system

As previously mentioned, solvent printing has the most drastic impact on the film. Depending on the amount of outgassing your process permits, if the film will be softer and tackier than its original state. In these cases, a thinner or softer overlaminate is not preferred. A standard 2-mil overlaminate or

a stiffer one such as Series 3270 would be more suitable. This extra thickness and/or stiffness will increase the film's stability during application while maintaining the same conformability level as its thinner or softer version.

C. Installer preference

Installers preferences will vary due to the difference in workflows and application style. For those who prefer “cold stretching” during application, a thinner laminate is more suitable.

D. Environment during application

The most drastic change in application performance for most films is during summer and winter. However, for climate-controlled shops, the change in season throughout the year will have very little impact on the film's application performance.

Note that the optimal application temperature range for most products is room temperature where the film and adhesive is more predictable. In cases where the application is outdoors (i.e. exterior wall wraps, shipping trailers, and tankers), the heat during summer makes the film softer and tackier. This can be mitigated by using a thicker and/or stiffer overlaminate.

During winter, the effect is opposite: the film is stiffer and tack is drastically reduced. A thinner and softer laminate would be more suitable in these conditions.

ADHESIVE SURFACE CONTACT AND TACK LEVELS

Wrap films vary in adhesive types such as repositionable, changeable, slideable, high tack, or ultra tack adhesives. Wall films lean towards high tack adhesives, especially films designed for textured walls, while vehicle wrap films preferably have low tack, repositionable adhesives. Some films are designed to be multi-purpose and can simplify inventory, but can still pose challenges on either scenarios.

Depending on the starting tack level due to the adhesive type or the ambient/surface temperature, you can increase the tack level by exposing more of the adhesive, while releasing the backing paper little by little keeps the tack level low. Since wrap films have a pressure-sensitive adhesive, using a firm squeegee pressure “locks in” the adhesive, while light pressure allows you to somewhat set the film into place while leaving room for correction in case you need to snap up the film. Just make sure to do a final squeegee pass with firm pressure to ensure maximum surface contact.

Managing Air Bubbles

Occasional bubbles may occur due to improper squeegee pressure or missed squeegee strokes. The best way to fix them is to prevent them from occurring in the first place.

Some films have micro air-egress channels so that the film has a smoother surface finish. This means that these channels are both narrow and shallow.

High temperatures and excessive solvent residue soften the adhesive and make it “swell”. To combat this, you need tension and a 2-tier squeegee pass.

- ▶ Tension (also known as “glass”) keeps the film taut and reduces the amount of pre-tacking areas that create islands or pockets of air bubbles under the film
- ▶ The 2-tier squeegee pass means applying with low pressure on the first pass, and finishing with high pressure on the second pass.
 - The first pass with low squeegee pressure allows most of the air to exit without “overloading” the air-egress channels. It also reduces the occurrence of wrinkles and makes repositioning easier if needed.
 - The second pass with high/firm squeegee pressure is to secure the film down by having the adhesive make full contact with the substrate.

Following the steps above will drastically reduce or even eliminate air bubbles, but if they still occur, it is better to tackle them sooner than later.

Regardless of the size of the bubble, if the air-egress channels around it has been closed or sealed off, the only way to get rid of the air is with a needle-point tool. Avoid using a blade which leaves a slit instead of a pinhole. Avoid making large bubbles smaller by spiraling towards the center, instead, split the bubble into smaller sections until each is under ½ inch in radius, then flatten individually.

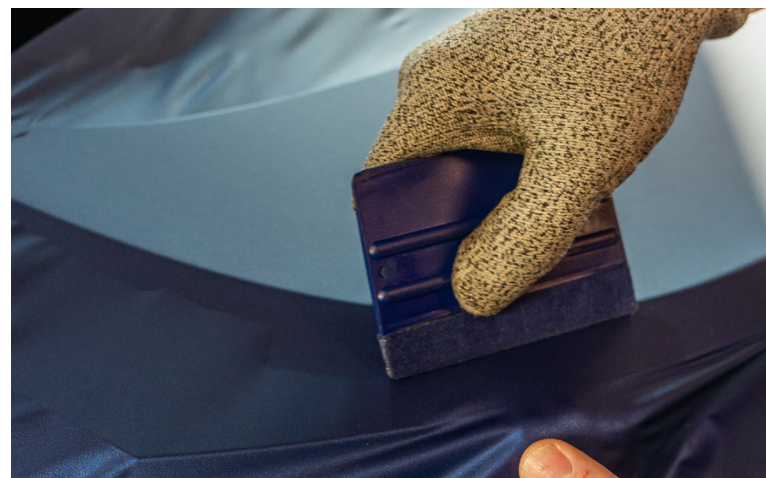




You can also poke multiple holes in the bubble and work on a separate area for a few minutes. This will allow the air pressure equalize on its own without stretching the film. Just make sure to go over the same area with firm pressure and medium heat to seal the deal.

POST-HEATING

Most would try to save time by skipping post-heating. However, post-heating is the Quality Control of the wrapping process. Once the vehicle is fully wrapped, it is essential to ensure that the adhesive achieves 100% bond on critical areas like edges and overlaps. For vehicle wraps, post-heating is also necessary on stretched areas and compound curves.



To post-heat, use a heat gun and heat the film up to 200–220°F (95–105°C). Once it reaches the desired temperature, reapply pressure by hand with a glove, a squeegee, or a roller depending on the area.

For any additional questions, **visit [wrapitright.com](https://www.wrapitright.com) for video tutorials or contact Arlon's Technical Solutions team via email at techservice@arlon.com** to ensure that you are setup for success.