DAF Products Inc.
Graphic Media Specialists

General Instructions for Lamination

General Rules:

- Allow 24 hours for ink to dry before Laminating.
- Printed surface should be room temperature before laminating.
- Correct tension control is important to avoid wrinkles, boat wakes and tunneling. Do not stretch the graphic film or laminate during Lamination.
- Allow at least 24 hours after laminating before install.
- For PSA Laminate and using heat assist:
    a. Eco-Solvent: (95-100F) top roll temperature can sometimes help the bond to a difficult substrate particularly to heavy ink area. However too much heat can also exacerbate stretching of the laminate.
    b. UVC: heat assist may be required help the adhesive fill in the texture created by the UV inks. In this case, use higher temperatures, around 114F, and 90-100 pressure and Slowing the laminator speed down to 3 fpm this will give the film more time on the heated laminator roll.
- Best method of shipping is to lay graphic flat between protective board. If it is necessary to roll graphic, please wind onto core to prevent the Liner from Tunneling or Graphic/Laminate from wrinkling. Always roll with the print side facing out.

Avoiding common problems:

- **Pre-test:** There is not one film that can do everything. It is always best to Pretest film for your specific application.
- **Ink and adhesion:**
    a. Make sure that the inks are completely dry before laminating. Over-inking will increase dry time and could inhibit adhesion. Use specific profiles where available or best match to material.
    b. Eco-solvent and Latex; ink manufacturers add specific components to speed drying times, which can create adhesion problems with laminating films. Additives such as waxes, surfactants, oils, and silicone can aid in reducing drying times but impede the ability of the laminating film to stick to the surface.
    c. UV-cured inks, can create their own set of challenges with laminating. With UV inks, the sheet is printed and must fully cure in-line during the printing process through the exposure to UV light. If the ink is not fully cure, adhesion will initially look good with the laminating film. However, after a few days the film can delaminate. The reason for this is that monomers can rise to the surface, breaking the bond.
- **Curling: Does laminating eventually cause curling? What can you do to reduce curl?**
  Curling can happen with both one- or two-sided lamination. With upward curl, there needs to be less unwind tension on the top roll of film or increased tension on the bottom roll to effectively flatten the sheet. The opposite would be recommended with downward curl.
    a. Curl is typically stretch-induced, which usually can be easily corrected by increasing or decreasing the unwind tension of either the top Laminate or bottom roll of film, depending on the direction of the curl. In addition, if the machine is equipped with anti-curl devices such as a breaker bar, adjustments with this can help decrease curl, as well as, adjusting nip pressure.
- In many situations, a combination of several techniques mention above is necessary to achieve desired results.

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