Avery® Instructional Bulletin 4.06
Processing Tips for Avery® DOL™ Films

Introduction

This bulletin provides recommendations for the application of Avery DOL clear digital overlaminate films to provide additional abrasion and weathering resistance to digitally printed images. The procedure for applying premask, packaging and converting films is also covered. It is also imperative that you understand, and practice the proper safety and operating procedures recommended by the manufacturer of your laminator.

Overlaminating printed images with transparent overlaminate films is a necessary step to provide maximum performance of finished images. Overlamination provides gloss, colour depth and graphic protection.

Laminating / Premasking Equipment

To properly apply Avery DOL films and approved premask, a laminator will be required. The information contained in this bulletin provides an overview of the use of Avery DOL films with the proper equipment. For specific information regarding equipment, follow the manufacturer's instructions or consult with the manufacturer's technical service department.

Laminator Set-Up Tools

In addition to the set-up procedures and tools recommended by the laminator manufacturer, it is recommended that the nip pressure and 'footprint' of the laminator be monitored.

Nip Impression Paper

Nip impression paper is a wax transfer paper used to determine the evenness of the nip 'footprint' across the width of the laminating rolls. If the footprint is inconsistent (too heavy on the edges, too heavy in the middle, or too heavy on one side), poor adhesion of the overlaminate, or wrinkles may result.

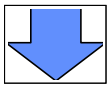
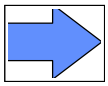
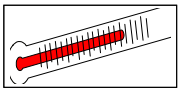
Alternatively, an inexpensive nip impression paper can be made by printing three solid black images on plain paper in a xerographic copier or printer. The laminator rolls must be hot to perform this test. Mark the strips left, right, and middle and insert the sheets into their respective positions between the top and bottom heated rolls. Close the nip momentarily (about 10 seconds). Remove the sheets and examine the consistency of the impression across the width of the laminator. If necessary, adjust or repair the laminator according to the manufacturer's instructions.

Prior to Laminating

Prior to beginning lamination, ensure the following:

- The rollers of the laminator are clean and not damaged.
- The rollers are parallel to each other.
- The rollers are set at the correct temperature and pressure.
- The material is laminated in the centre of the laminator, in case the materials are narrower than the laminator.

To operate the laminator, the following settings are recommended:

DOL Range vs. Settings	 Pressure	 Speed	 Roller temperature
Avery DOL 1000 / 1100 DOL 2000 / 2100 DOL 3300 / 3400 / 3500 DOL 4300 DOL 5900 / 6000 / 6100	50-70 psi	0 - 2.5 m/min	20-35°C

- Always set the lamination tension of the overlaminate and the printed substrate in such a way that they are laminated flat but without stretching.
- Improper tension adjustment is the major cause for wrinkles and possible delaminating. This is caused by the tension difference of the laminate and media.

Note: Increased roller temperatures in combination with higher winding tension could lead to unwanted elongation of the film and image. Winding tension therefore should be carefully monitored and kept at an appropriate level.

For specific settings on the laminator, please consult the technical manual from the original supplier of the laminator.

Lamination

The following general recommendations apply to overlaminating Avery digital print media with Avery DOL clear overlaminate films. For specific instructions relating to equipment operation when overlaminating, please refer to the instructions provided by the laminator manufacturer.

1. The use of heat is not recommended when overlaminating with Avery DOL clear overlaminating films. Should heat be required in the overlamination process, do not exceed 38°C on the top or bottom roll.

2. To overlaminate printed Avery digital media roll-to-roll, mount the printed film on the bottom roll unwind and follow laminator manufacturer recommendations for unwinding from the bottom shaft.
   Pull the printed film through the front nip (image side up). Continue pulling the web evenly through the back pull rolls. Close the back pull roll nip and apply 50-70 PSI (350-490 kPa).

3. Mount the Avery DOL clear overlaminate film on the top unwind and web according to the laminator manufacturer recommendations. Pull the release liner away from the overlaminate film and adhesive. Attach the liner to the upper rewind shaft to accumulate the delaminated liner. Pull the overlaminate film evenly through the front nip until the web is wrinkle free with even tension across the web. Close the front nip and adjust the pressure to 50 PSI (350 kPa). Start running the laminator at 1.0 FPM (0.3 m/min). Cut away the overlaminate film and adhesive before it reaches the back nip.

4. As the overlaminated film passes through the back roll nip, inspect the web for signs of wrinkling, waviness, bubbles, etc. If problems are evident, stop and correct them before proceeding. Once the overlaminated film looks good, increase the speed to 4 FPM (1.2 m/min.).

   NOTE: Overlaminated graphics are less flexible than typical pressure sensitive film constructions. For best results, feed the overlaminated graphics onto a flat table and cut into sheets.

5. To hand feed printed sheets into the laminator, web the Avery DOL overlaminate as instructed in this section. Use a length of release liner beneath the print to protect the bottom roll from contacting the adhesive. The liner can also be used as a leader to begin sheet feeding.

6. Once the Avery DOL overlaminate has passed through the front nip, close the front nip and adjust the pressure to 50 PSI (350 kPa). Start running the laminator at a speed of 1.0 FPM (0.3 m/min). Cut away the non-laminated clear film between front and back nips.

7. When the Avery DOL overlaminate is feeding evenly, begin feeding printed sheets into the nip, taking care to align the sheets evenly with the overlaminate. Increase the running speed as desired. Adjust the overlaminate unwind brake to maintain the minimum tension required to keep the overlaminate free from wrinkles. As the sheets exit the back pull roll nip, cut between the sheets.

8. For graphics to be applied by hand (not roll laminated onto a board surface), such as vehicle graphics, window graphics, etc., a premask is recommended to protect the graphic from damage during handling and application.

Application Tapes (Premasks)

Application tapes are self-wound specialised paper (or plastic) pressure sensitive tapes with an adhesive on one side. It is applied to the front of graphics before applying the graphics to the substrate. The application tape aids in the successful production, handling, and protection of a graphic during application.
An application tape has a lower adhesion to the film than the film has to the substrate; this is why it is easier to remove from the film.

Application Tape may also be referred to as ‘premask’ or ‘pre-spacing tape’.

Application Tape Selection
The type of application tape required depends on the type of graphic being produced, ink used and overprint clear coat used.

Recommended application tape for Avery pressure sensitive films

Tack (Adhesion Level)	Unprinted Recommended Premask	Printed Recommended Premask
Low Tack	American Biltrite 6760 R-Tape 4700	American Biltrite 6882 (for UV Inks) R-Tape 4700
Medium Tack	American Biltrite 6782 R-Tape 4760	American Biltrite 6782 (for Solvent Inks) R-Tape 4760
High Tack		American Biltrite 6792 (for Solvent Inks) American Biltrite 6892 (for UV Inks) R-Tape 4775

- Four-color process printed decals may require heat lamination to prevent tunneling of application tape.
- It is recommended to allow the premasked graphic to dwell for a minimum of 3 hours before applying the finished graphic.

Generally it is not necessary to use an application tape on film that is 100 micron or thicker, or for any film that has an overlaminate film applied. However, an application tape does prevent stretching and protects the graphic during handling and application.

After applying the application tape, avoid exposing the graphic to sunlight except during application. Sunlight, or UV light, can cause the tape to permanently bond to the film.

Packaging

Finished graphics should be wound face out with a minimum inner diameter of 15cm. Keeping the inner diameter at 15cm or larger will prevent the graphic from tunneling.

Troubleshooting

The following table describes a number of common problems encountered in image transfer and overlamination, along with possible causes and solutions:

Problem	Possible Cause	Solution
Wrinkles in film going into nip	Tension too low	Increase unwind brake setting on affected web.
	Uneven feeding of webs	Cut webs and re-thread according to steps described.
	Uneven tension across web	Reduce unwind brake setting momentarily and then increase to bring tension back up.
Mottle or air bubbles in overlaminated graphic ('silvering')	Not enough pressure at nip	Increase pressure.
	Running too fast	Reduce speed in 0.5 FPM (0.15 m/min) increments.
	Uneven footprint in nip	Check graphic – if mottle has consistent repeat in roll direction or is heavier on one side, problem may be in laminator set-up or laminator rolls. Refer to instruction manual or contact laminator manufacturer.
Mottle in adhesive coat		Check mottle pattern – if consistent across web or decreases in repeat as roll unwinds, problem may be adhesive related. Try slower speed, higher pressure, or add heat (no more than 38°C).

For further information, contact your local Avery Graphics representative.