

Application Avery Dennison SuperCast films on irregular substrates

Instructional Bulletin #4.07 (Revision 2)

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1.0 Overview

Avery Dennison™ Supercast films offer superior conformability to irregular surfaces such as compound curves and corrugations. This bulletin provides guidelines for applying to these irregular substrates using the Supercast line of films with the 90# smooth adhesive, Easy Apply, and Easy Apply RS adhesive technologies.

NOTE: Be sure to read the appropriate Product Data Bulletin for details about each film for complete information regarding minimum and maximum application temperatures, recommended substrates, and immediate service conditions before and after application. These factors are critical to a successful application and future decal performance. Once assured that all factors are understood with respect to the product, and all factors comply with the product recommendations, cleaning and surface preparation can begin.

IMPORTANT: Documentation of application date, material lot number, and application conditions (temperature, substrate, etc.) are required to support warranty claims in the event of decal failure.

2.0 Benefits of Avery Dennison™ Easy Apply and Easy Apply RS

Avery Dennison™ Easy Apply and Easy Apply RS technology enables an installer to apply graphics faster and limit the risks associated with graphic application such as wrinkling and entrapped air bubbles. In addition to minimizing these risks during application an installer can also re-position a graphic within the first few minutes of applying material. If air bubbles are trapped, it is possible for small bubbles to be pressed out with relative ease.

The Easy Apply RS films have the added advantage of repositionability or slideability of graphics as well as air egress.

Avery Dennison™ Easy Apply films will allow installers of all levels to install graphics with greater ease and in less time.

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3.0 Tools and Techniques

3.1 Traditional Application Tools:

Avery Dennison™ Easy Apply Films can be applied using traditional tools and techniques, special tools are not required. (Refer to Instructional Bulletin #4.00)

- Tape measure – for positioning
- Air release tool – for removing air bubbles
- Masking tape or magnets – for positioning
- Marking Pencil (chalk lines should not be used) – for positioning of graphic
- Squeegee – for applying the graphic
- Low Friction Sleeve or felt strip to cover squeegee edge – to protect graphic during installation
- Sharp Razor Knife (preferably with break-off blades) – for trimming away excess vinyl
- Heat Source (heat gun is recommended for vehicles, torch is ideal for rivets) – for heating the vinyl on complicated applications and to set vinyl into place after install
- Rivet Brush – for conforming to rivets
- Surface Temperature Thermometer/ IR Thermometer – for checking surface and ambient temperature
- Application gloves

3.2 General Application Techniques

As with any technique, the skill of the installer can make a big difference. However, with Avery Dennison™ Easy Apply Films, most installers can achieve high quality results and the installer can usually complete the job in less time than with most other films.

- Ensure that the application surface is clean and dry before application of any graphic film.
- Use the conventional methods for positioning and hinging the graphics as described in Instructional Bulletin #4.00.
- Select the proper installation tool.
- Always use adequate pressure and be sure to use more pressure when applying graphics that have a pre-mask.
- Use firm, uniform overlapping strokes to adhere the film to the substrate
- Reheat & Set graphics, paying close attention to overlap seams, edges, and areas where material has been manipulated to conform to complex shapes.
- Re-squeegee all graphics edges, overlaps, and seams using firm pressure.

4.0 Surface Preparation

4.1 Prepare the application surface.

- A clean, dry application surface is absolutely necessary to facilitate the proper bonding of an adhesive to the application surface. Refer to Avery Dennison Instructional Bulletins #1.10 Substrate Cleaning and Preparation and #4.00 Application Instructions for Avery Dennison for specific technical recommendations.

4.2 Application Temperature

- Take time to review the recommended application temperature for film, air, and substrate.

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- Air, film, and application surface temperature are important and must match the characteristics of the adhesive and film being applied.
- Lower temperatures restrict good adhesion properties, which increase the risk of a graphic failure due to low levels of adhesion.
- Easy Apply Series films have a broad application temperature range (refer to the appropriate product data bulletin).
 - While the film can be applied at the lower end of the temperature range, more pressure will be needed and it will take longer for a functional bond to be achieved during application.

Until a “functional” bond is achieved, it is risky to remove premask or allow a vehicle to be transported.

- Higher heat and humidity conditions may also make a graphic more difficult to re-position once it has made contact with the applications surface.
- If the air temperature or the application surface temperature exceeds 100°F (38°C), Avery Dennison™ Easy Apply performance may be limited.
- The ability to move trapped air can be adversely affected by the amount of pressure used previously to apply the graphic to the substrate.
- For optimal application performance and ease-of-use characteristics, a minimum temperature of 60°F (16°C) is recommended.
- Allow 24 hours for graphics to fully set prior to placing graphic marked vehicles into service.

5.0 Application Instructions

⚠ WARNING

Failure to install the film in full compliance with Avery Dennison’s installation instructions may result in personal injury or property damage. Read and follow all instructions when installing the film.

Avery Dennison Supercast films have a high degree of conformability compared to other cast vinyl films. On surfaces with extreme contours Avery Dennison Supercast films show excellent results. To achieve these results, the use of an industrial hot-air tool (i.e. heat gun) is needed to improve the ease of application.

Important: After application it is absolutely necessary to re-heat those parts exposed to stretch, strain or other deformations to obtain its final shape. Re-heating will eliminate the applied tensions in the film. Always respect the minimum application temperatures as given in the technical datasheets.

Avery Dennison Supercast films are designed for dry application to prepared surfaces; this application process will be described in this document.

Depending on the substrate or climate the use of an application tape (premask) may be required. In climates with high temperatures or for large truck graphics using an application tape is recommended to maintain the integrity of the graphic. Please reference Instructional Bulletin 5.50 “Tips for Overlaminating, Pre-masking, & Packaging Graphics” for more information on choosing and applying application tapes.

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5.1 Application Notes

CAUTION: NEVER use wet application for Easy Apply films.

- Ensure that the application surface is clean and dry before application of any graphic film.
- Be sure the air, film, and substrate are within the temperature range recommended for the film.
- Experiment with what tool and technique works best before applying large graphics. Easy Apply Series films are designed to work with a variety of tools and techniques. Whatever the tools or technique, it is important to use enough pressure to make sure the graphic firmly adheres to the substrate. NOTE: Pre-masked graphic requires additional pressure.
- Overlap all strokes by about 50%.
- Always ensure your squeegee has a smooth edge without nicks to ensure a smooth graphic finish after application is completed.
- If a squeegee is used, hold it at 50-70 degree angle to the surface. The flatter the squeegee the better!
- Locate where to position graphics and mark the spot using small pieces of masking tape.
- If the graphic is large, tape it into position securely with masking tape and use a masking tape hinge method illustrated in Instruction Bulletin #4.00.
- If the graphic is less than 8 square feet, remove the entire liner. Position the graphic on the marked points using light tacking pressure similar to other Avery Dennison materials.
- Squeegee the film using moderately firm, overlapping strokes, making sure the applicator is flat with the substrate along the entire length of the stroke.
- Remove air bubbles and tenting around rivets by using an air release tool and heat source.

5.2 Remove air bubbles and tenting around rivets.

- Air bubbles in an installed graphic can be removed easily by applying pressure to the middle of the bubble with your thumb and rub out toward the bubble edges. The air will disperse along the air egress channels. There is no need to make air release holes unless the air bubble is over 1" in diameter. In that case, use an air release tool and remove the air using conventional techniques.
- Tenting around rivets can be handled in one of two ways:
 - 1) Use an air release tool, heat source, and rivet brush. (Reference Section 3 for recommended tools)
 - 2) Press the top of the rivet head down then force air away from the rivet and into the flat area surrounding the rivet head. Use an air release tool and make a small hole to release the air, then heat the film around the rivet. While still warm, press the film down tightly around the rivet head using a rivet brush.
To secure the film around the rivet head, a heat source must be used and work the film in a circular counter clockwise motion back towards the base of the rivet head.

5.3 Compound shaped surfaces:

This is generally a complex form of concave and convex shaped surfaces, which can be found one after another or even side by side. In modern models of cars or vans one can find these shapes frequently.

Deep recesses (i.e. Sprinter van window area):

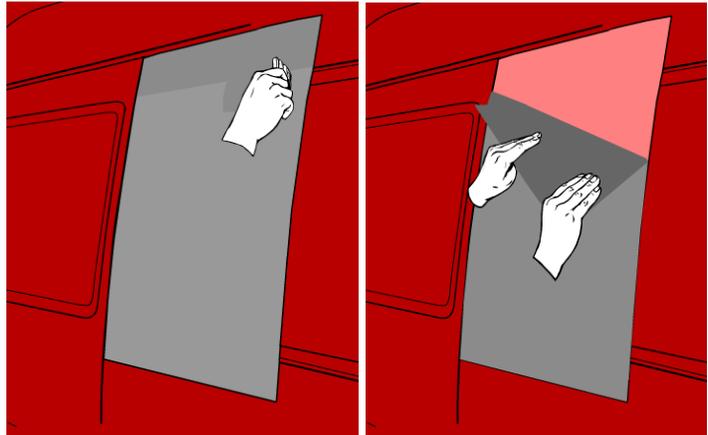
NOTE: The use of a primer coat may aid in the ultimate adhesion and conformability of the graphic in deep channels or compound curved areas. However, primer use does not eliminate the need to properly prepare substrates, and apply graphics to the recommendations made in this bulletin, including but not limited to post heating or setting.

1. Position the film to the application surface with a masking tape that can serve as a hinge (see Instructional Bulletin 4.0). Ensure that the hinge is in a flat section of the surface. Only remove a small area of liner to prevent pre-sticking.

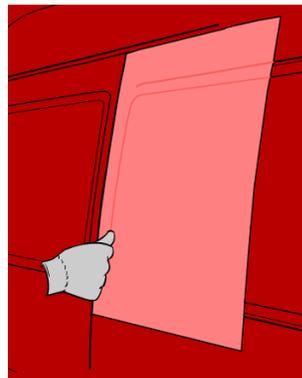
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2.
 - Application to this type of surface has to be done systematically; section by section is the best approach. Deviation from this application sequence may result in wrinkles, which are sometimes difficult or even impossible to be eliminated.
3. Start the application at the hinge (continue section by section) and apply the film from the center to the film or graphic edges. This method will limit the occurrence of wrinkles.

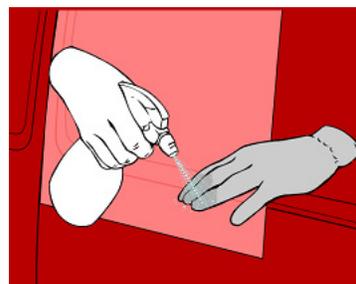
4. While keeping the adhesive free from the substrate, apply the film with a plastic squeegee. Do NOT stretch the film, but follow the irregular shaped surface. Use the full width of the squeegee and press the film firmly down over the entire surface area. Vertical sections should be applied with vertical squeegee strokes. Make sure the film is applied correctly in the edges, corners, seams, etc. If used, remove the application tape after 3 to 5 minutes and re-squeegee the edges or corners.



5. When edges and corners are re-squeegeed, make sure the material is fixed on the edges of the corrugation (see below), and work your way around the entire corrugation, just fixing the edges.



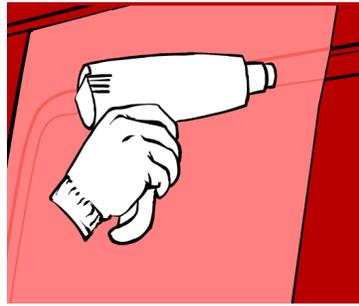
6. Now the application of the material in the corrugation can start. In order to be able to do so without forming wrinkles or creases, it is advised to wet the glove, using a water/soap mixture.



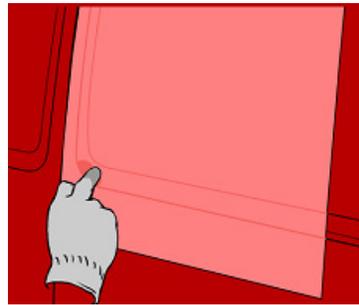
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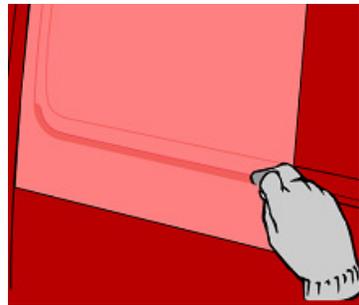
7. The next step is to heat the material gently, using a hot-air gun, to about 105°-120°F (40°-50°C). It is advised to do small areas at a time.



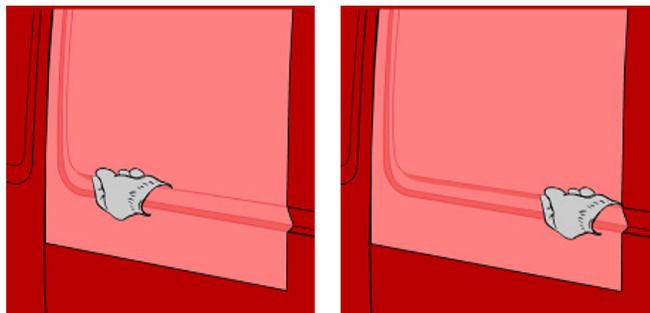
8. Now, start stretching the material in the corrugation, starting in the deepest part of the corrugation first. Make sure that the material is heated to remain at the 105°-125°F (40°-50°C) temperature.



9. Continue your way around the corrugation, only focussing on the deepest part of the corrugation.

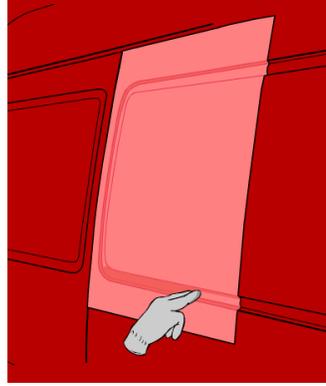


10. When all the deepest parts of the corrugation have been applied, the inside of the corrugation can be done. Again, make sure the material is heated to the required 105°-125°F (40°-50°C), and work your way through the corrugation.

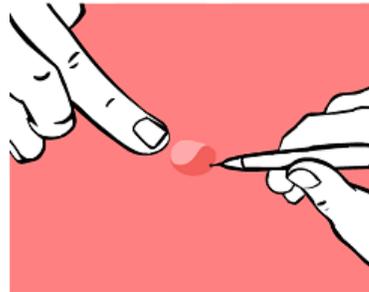


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11. With all the edges properly applied, it is necessary to apply the material in the center of the corrugation. When doing this make sure that the air is not trapped, always leave an opening for the air to escape.

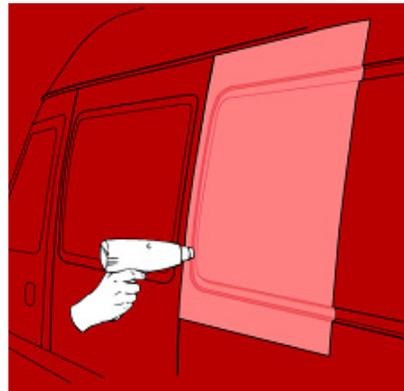


12. Check the application for remaining bubbles. If there still are small air bubbles to be seen, these can easily be removed. Just make a small puncture, heat it a little and push the air out.



13. Then the final stage of the application starts. Using the hot air gun, the material should be heated to a temperature of approx. 175°-194°F (80-90°C), especially in those areas where the material is stretched. Make sure that the heating is done gently, and the temperature is gradually increased.

NOTE: It is important that not only the film reaches these temperatures, but also the substrate should be heated to these temperatures. This can best be achieved by re-heating gradually, instead of a short blast of heat.



6.0 Final Squeegee Pass. Tips on Good Re-Squeegee Techniques:

NOTE: This is a key final step and will help prevent premature graphic failure due to edge lifting.

- Wait at least 5–10 minutes after the application to allow the adhesion to build to the functional bond level before removing application tape (if one was used)

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- Re-squeegee all graphic edges, overlaps, and seams using firm pressure. Use a squeegee with a low friction sleeve to prevent scratching or damage to the decal. Re-squeegee is a must on ALL edges of the decal.

7.0 Confirm Adequate Adhesion

Ambient temperature is a key environmental factor affecting adhesion of pressure sensitive adhesive films. The warmer the ambient temperature is, the less time it will take the film to achieve adequate adhesion. Temperatures below the recommended low application temperature may take significantly longer, even days, to achieve adequate adhesion.

Until you are comfortable applying the film in various service temperature conditions and using any new application methods or tools, it is recommend that a quick test be performed to ensure that there is no air trapped under the graphic.

- Wait several hours after application so the adhesive has reached its functional bond level.
- Using a squeegee with a friction sleeve, rub a small section of the graphic using firm pressure.
- If air bubbles are apparent and larger than a ½” to 1” in diameter during the test, the application method and/or the temperature used was not adequate.
- If the adhesion is not adequate and the graphic must be put into service right away, carefully re-squeegee the graphic (using a squeegee with a friction sleeve). Re-squeegee the film using greater pressure, overlapping strokes, and making sure the applicator is flat with the substrate along the entire length of the stroke. This will help improve the adhesion of the graphic.

8.0 Test Sensors

Test all vehicle components and sensors and confirm that they work correctly before releasing the vehicle to the customer. If necessary, cut and remove any film that covers sensors.

9.0 Warranties and Limited Remedy

This instructional bulletin describes a technique. The information contained herein is believed to be reliable, but Avery Dennison makes no warranties, express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. To the extent allowed by law, Avery Dennison shall not be liable for any loss or damages, whether direct, indirect, special, incidental or consequential, in any way related to the technique of making a graphic regardless of the legal theory asserted.

Revisions have been italicized

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