

Application of Avery Dennison™ Films

Wet Application Method - Window Films & Illuminated Graphics

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1.0 Overview

This bulletin gives specific instructions for application of Avery Dennison™ film onto flat transparent or translucent substrates (i.e. glass, polycarbonate, acrylic) using the wet application method. Wet application involves the use of an application fluid sprayed onto the application surface and adhesive to provide the following advantages:

- Increased time for positioning before adhesion builds,
- Repositioning without distortion,
- Improved visual appearance immediately after application without noticeable difference in squeegee pressure or air bubbles

If the wet application method is performed using water and mild detergent or a commercial application fluid it is extremely important the following procedures and processes are followed.

2.0 General Information Pay careful attention to the following attributes:

2.1 Recommended Tools

- Plastic Applicator, (squeegee).
- Low friction sleeve, (Use a low friction sleeve on the plastic applicator to minimize the possibility of surface scratching of un-premasked film).
- Pin (air release tool).
- Razor blades/cutting knives.

2.2. Adhesive Properties

Adhesives are designed to provide a certain level of tack and increased adhesion over time. These adhesion levels are completely changed with the introduction of an application fluid and adhesion will

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not build until the fluid is expelled from underneath the film or evaporates. Different adhesives are designed to have different adhesion levels and should be considered as part of the process or graphics failure may occur.

Before performing a wet application of clear, transparent or translucent films ensure that the adhesive is solvent-acrylic based. If emulsion-based adhesives are applied using the wet application method the adhesive may appear milky due to the fluid causing adhesive whitening. The adhesive whitening may disappear after a few hours or days but not guaranteed.

2.3. Ambient & Substrate Temperature

If the ambient and substrate temperatures are low the application fluid will take a long time to evaporate and adhesion will not build. If the temperature is below the products minimum application temperature the adhesive will not provide an acceptable level of adhesion. Both may result in graphics failure. Please consult the Product Data Sheet for minimum application temperatures.

2.4. Surface Cleaning and Preparation

Like in any graphics application it is absolutely critical surfaces in which the graphics will be applied are thoroughly cleaned of dirt, grime, grease wax, coatings or other contaminations which could affect the adhesion of the pressure-sensitive films.

Please refer to [IB 1.10 Substrate Cleaning and Preparation](#).

2.5. Application Fluids

These fluids are designed to reduce the friction and neutralize the adhesion of the film to the application surface. This fluid should be expelled or evaporate from between the film and surface after application to gain ultimate adhesion. If any additives are used they can contaminate the surface and cause graphics failure. It is highly recommended that installers fully follow the manufacturer's instructions for proper use and quantity.

2.6. Application Techniques

Technique must be considered in order to obtain the best visual appearance and remove any fluid to ensure maximum adhesion. Firm, overlapping squeegee pressure is required to remove application fluid and re-squeegee edges before and after the removal of application tape if used. It may be necessary to gently "spread the film over the surface film is being applied to before firm overlapping strokes to minimize the potential for tearing the film.

3.0 Application Methods and Procedures - Window Films

Removable adhesives are recommended for glass application, to minimize adhesive residue when removing at the end of the graphics life.

3.1. Temperature

Ambient and surface temperature should ideally be between 60°F and 77°F (16°C and 25°C), but must be above the minimum application temperature of the film being used. If the temperature is too

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low the fluid will take more time to evaporate. This may cause issues when removing the application tape if used.

3.2. Surface Cleaning and Preparation

- Remove any tape, stickers, paint, stain or overspray, using a solvent cleaning solution and a single edge scraper blade. Apply a solvent cleaning solution (i.e. Isopropyl Alcohol or Prepsol) to the surface to loosen any contamination whilst reducing the chance of scratching the surface. Use a fresh blade for each job and check the blade for imperfections that may cause scratches.
- Once the glass has been scraped clean of contaminants, spray the surface with a water and detergent solution and scrub the surface with a scouring pad, scrubbing brush or sponge.
- Squeegee the surface with a soft rubber window squeegee to remove any remaining cleaning solution or contaminants. Wipe the edges dry using lint-free paper towels or cloth.

NOTE: Do not use glass cleaning products that contain additives such as silicon, ammonia or others as they will contaminate the surface and reduce adhesion strength.

3.3. Application Fluid

- The application fluid must be predominantly water. A solution of 25% isopropyl alcohol to 75% water will allow for easier placement and repositioning. If the isopropyl Alcohol is evaporating too fast add no more than two (2) drops of a mild liquid detergent which will act as a slipping agent. If larger quantities of detergent are used it will contaminate the adhesive and reduce adhesion strength or cause visual cloudiness or whitening between the application surface and film.

NOTE: Do not use commercial detergents with additives (i.e. moisturizer, enzymes, perfumes, lanolin) that can contaminate the application surfaces and reduce adhesion.

- If using a commercially available application fluid, follow the dilution instructions provided by the manufacturer. In many cases you will find you can dilute the solution with water further than instructed.

3.4. Applying Application Fluid

- Using a pressurized spray bottle apply a light mist of application fluid onto the application surface and adhesive side of the film. Do not use excessive amounts of application fluid as it may cause: The graphics to slip and slide excessively on the surface and make the application extremely difficult. Too much fluid to be trapped between the application surface and film creating water bubbles, poor adhesion and graphics failure.

3.5. Positioning

- Position the graphics in the correct position on the application surface. Ensure the graphics is laid smoothly and flat without any large water or air pockets/bubbles.
- If the graphics are computer cut and depending on the film used, apply using application tape, which will be easier to remove after application

3.6 Squeegee Technique

- Squeegee from the top and center moving out towards the edges of the graphic. This will ensure that the water is expelled from behind the graphic and water is not forced to seep under the top edge or get trapped in the center.

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- Use firm overlapping squeegee strokes to remove the application fluid and any air trapped underneath the film. It is critical to remove all application fluid via squeegee to get maximum adhesion to the application surface. Any water remaining trapped between the substrate and the decal can reduce adhesion and can cause graphics failure.

3.7 Trimming

Trim the graphics back from any edges ensuring it is not overlapping or touching any rubber or silicone window seals. If the graphics are applied to these surfaces it will cause poor adhesion and graphics may fail by either lifting or curling.

After trimming re-squeegee all of the edges before and then again after the application tape is removed.

3.8 Special Considerations on Glass

Avoid using large areas of dark colors on glass, especially black or large areas of highly contrasting colors. If these graphics are exposed to direct sunlight it can cause thermal shock or stress resulting in glass breakage or cracking.

Because of the unique properties and varieties of glass, special considerations must be considered for windows and graphic applications. Avery Dennison accepts no liability for glass breakage. • Glass absorbs heat when exposed to sunlight. The degree of absorption across windows can vary because of shading, heating, and cooling ventilation, and insulation from window frames. These temperature differences across the window produce stress, which can cause glass breakage. The ability of glass to resist breakage because of temperature stress is affected by window size, glass thickness, glass treatments, quality, and design

4. Application Methods and Procedures - Illuminated Graphics

4.1. Refer to Section 3 - Window graphics except for the following points:

- Remove protective film from substrate sheeting and allow the substrate to outgas as long as possible before preparation.
- If the application surface is acrylic sheet, polycarbonate or flexible sign face material do not use the scraper blade in the first cleaning step as it could damage or scratch the surface.
- See Avery Dennison [Instructional Bulletin 2.20 Converting Procedure for Vacuum Thermoforming](#)
- See Avery Dennison [Instructional Bulletin 4.01 Application of Avery Dennison Translucent Pressure Sensitive Films](#)
- Avery Dennison polyester films are not recommended for application to acrylic or polycarbonate sheeting. As these substrate outgas it will cause bubbles to appear in the graphics as the outgassing cannot permeate through the polyester film.

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5.0 Additional Information

The above information provides basic information on how to apply pressure-sensitive graphics using the wet application method. The instructions are designed to help ensure success across a broad range of applications. Depending on the size and complexity of applications, a certain amount of expertise is needed.

Professional applicators can be hired to ensure proper application of finished graphics. When applying graphics in remote geographic areas, professional applicators can offer the added benefit of local service. Consider hiring a professional whenever the application requires:

- Multiple panels to be registered
- Complex surfaces, such as watercraft and vehicles
- Harsh environmental conditions (i.e. outdoor applications in high heat climates)
- Remote geographic locations

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