Avery Dennison
Graphics Solutions
Instructional Bulletin

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Avery Dennison® Instructional Bulletin 6.6 Application Instructions for Paint Protection Films (PPF)

Revision 0

Introduction

Avery Dennison Paint Protection Film (PPF) is a new generation conformable top coated Thermoplastic Polyurethane (TPU) film, designed to provide excellent protection for automotive, transport, marine and OEM applications.
Avery Dennison PPF is available in Xtreme, Xtreme Plus, Xtreme XL, Ultima, Ultima Plus, which are clear high gloss and satin films, and Spectrix colour PPF which is currently available in four gloss colours. These films can resist light scratches to the specially designed topcoat, these scratches will disappear at normal room temperature, the application of heat can aid in scratch removal. Scratches that penetrate deeper than the topcoat cannot be removed, this is a normal characteristic of a PPF film and not deemed a failure of the material. This instructional bulletin provides information and recommendations for the successful installation of the product.

Important Note: As with all graphics films, it is important to avoid using any hard solvents (i.e. IPA (Isopropyl Alcohol) or Avery Dennison Surface Cleaner) directly on the surface of Avery Dennison PPF during the application process or afterwards when cleaning. Use of these products directly on the surface may cause matting, loss of gloss and prematurely degrade the film. For cleaning and maintenance consult Avery Dennison Instructional Bulletin 1.8 for further information.

1.0 Consult Product Data Sheet

Before applying the product, consult the appropriate product data sheet and instructional bulletins for information regarding suitable substrates, application and product performance.

2.0 Handling and Storage Conditions

Avery Dennison Paint Protection Films (PPF) come in a variety of constructions and finishes and require special handling when converting to smaller lengths from larger rolls when compared to traditional PVC graphic films.
PPF Xtreme XL is more difficult to handle when working alone, so it is advisable to have assistance when unrolling material from the main roll
Avery Dennison gloss Paint Protection Films are supplied with a protective cap sheet, this cap sheet should be removed after first opening the roll. It is recommended to use a laminator or similar to remove the entire cap sheet from the whole roll before conversion or installation. Matte and satin films do not have the protective cap sheet.

Avery Dennison PPF should be stored at a temperature of 20°C (± 2°C) with 50 %RH (± 5%), vertically in the original packaging, ensuring the material is tightly wound around the core and fastened with tape. If stored loosely on the roll without the leading edge taped down the material can separate from liner and cause imperfections in the adhesive. Proper storage allows the film to keep its maximum performance and also enables a hassle-free application. The user assumes all risk and liability for the loss of performance when the film is stored improperly. Improper shall mean that the user did not store the Avery Dennison PPF in accordance with the aforementioned instructions.

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3.0 Application Tools

- Tool belt – to hold all application tools
- Avery Dennison PPF Squeegee Pro Rigid (Blue) and/or Pro Flexible (Red)
- Avery Dennison 30 degree Application Knife
- 30 Degree stainless steel replacement blades and blade disposal box
- Avery Dennison Magnets
- Avery Dennison Surface Cleaner or Surface Prep Pro
- Steamer with on demand steam - For conforming the film and tacking edges as required
- Avery Dennison Application Solution Pro and/or Avery Dennison Application Gel
- Tack solution: Hot water in heat resistant spray bottle
- Hot water urn (or access to hot water tap)
- Slip solution: 5-20L pump spray bottle or pressurised tank (with spray handle) containing water and Avery Dennison Application Solution Pro (4 ml of Avery Dennison Application Solution Pro per 1 litre of water)
- Lint-free microfiber cloths for surface preparation and cleaning
- Clay bar or eraser pad and recommended lubricant for removing hard bonded contaminants

Important Information

To avoid damaging the film, always ensure the application tools are in good condition and test the suitability prior to commencing the application.

It is the responsibility of the end-user/applicator to ensure all painted substrates have been processed and cured per the paint manufacturer's requirements. Failure to follow paint manufacturer requirements can lead to adhesion failure and/or removal problems.

The use of any chemicals recommended in this bulletin should be done with caution, and ALL manufacturer’s safety guidelines and warnings should be followed, including use of the appropriate personal protection equipment. When using Avery Dennison Surface Cleaner or Adhesive Remover, the use of chemical resistant Nitrile Gloves and Safety Glasses in a well ventilated area is required. Always read the instructions on the container, MSDS, or contact the manufacturer for usage guidelines.

4.0 Substrate Preparation and Cleaning

Note: Some new vehicles may have co-polymer paint protection coatings. These coatings make it difficult for pressure-sensitive adhesive films to achieve a functional bond. You should check with the vehicle manufacturer first, but it has been recommended to pre-clean with Autoglym Multiwash (previously Power Max 3). Ensure you follow the manufacturer's instructions: For removal of co-polymer paint protection coatings, a solution of 1 part Autoglym Multiwash, to 4 parts clean water is used in a spray bottle. Spray solution evenly on all areas of the vehicle (especially deep recess and 3D sections) agitate with a sponge, allow 5 min reaction time and do not allow to dry. If it dries, re-apply and re-work with a sponge, then rinse systematically with high-pressure water, preferably hot, removing all of the solution.

Note: Vehicle surface must be OEM paint in good condition and must be cleaned thoroughly to remove all dirt, grime, grease, oil, wax, polish, co-polymer or ceramic coatings and other contaminants. For ceramic coatings, review with the manufacturer on the best process for removal.

4.1 Pre Cleaning Wash

- Remove all dirt and grime with water and detergent solution
- Remove any co-polymer paint protection coatings with the use of Autoglym Multiwash, as per manufacturer instructions
- Do not use any polishes, waxes, tyre shining or plastic reviver agents post wash
- Allow the vehicle to dry ensuring no water remains in areas such as seals and behind door handles. A compressed air gun can be used to aid in drying hard to reach areas
- For any hard to remove grease, oil and wax, use a rag soaked in a solvent such as Avery Dennison Surface Cleaner or Isopropyl Alcohol (IPA).

Caution: Prior to cleaning with solvents, test the solvent on an inconspicuous area of the surface to check for potential damage from solvent usage.

4.2 Clay Surface

- Using either a professional clay bar or eraser pad and the recommended lubricant
- Clay the surface of the vehicle as per the clay bar or eraser pad manufacturers recommendations

Note: The surface must be completely clean, smooth, and dry before final preparation.

4.3 Final Surface Cleaning and Preparation

- After following the pre-cleaning instructions above, the substrate should be thoroughly cleaned with Avery Dennison Surface Cleaner.
- Spray Avery Dennison Surface Cleaner onto the substrate and allow it to dwell, remove using a clean, soft, lint-free cloth, remembering to rotate the cloth for each new area you clean.

or alternatively

- The substrate can be cleaned with an IPA and water solution (70% IPA and 30% water), using a lint free cloth or microfiber towel soaked with the solution and then wiped off with a clean dry lint free cloth or microfiber towel, before the solution has time to evaporate, remembering to rotate the cloth for each new area you clean.
- Take special care with recesses, corners, returns of panels, behind rubbers (e.g. inside edge of door) and any hard to reach areas
- It may be necessary to clean some areas more than once until the desired result is achieved

4.4 Final Check

- Check all critical areas using the 'nail test'. Feel the surface with the back of your fingernail. If the surface feels slippery and your nail slides easily, then it should be cleaned again. If it is difficult to slide your nail across the surface and it grips heavily, then the surface is clean.

Important Note: There must be no dirt, grime, grease, oil, wax, polish, copolymer or ceramic coatings or solvent residue remaining on the substrate prior to application.

5.0 Installation Requirements and Preparation

- Avery Dennison PPF has been designed to protect the surface of the car's body and can be applied to bonnets, bumpers, guards, rocker panels, door edges, pillars and most OEM painted substrates.
- Avery Dennison PPF can be hand cut on the substrate after installation or plotter cut using general plotters, specialised software and templates prior to installation.
- Ensure the Avery Dennison PPF is applied in a clean, dust-free and well lit environment.
- Before starting the application, it is recommended to wash your hands to prevent transferring any contaminants or fingerprints onto the adhesive.
- Avery Dennison PPF needs to be applied using the wet application method, by combining water and Avery Dennison Application Solution Pro. This is your "Slip" solution.
- For optimal application performance, the recommended slip solution is a mixture of 1 litre of water per 4 ml of Avery Dennison Application Solution Pro. Eg. For 5L of water add 20 ml of Avery Dennison Application Solution Pro. You can adjust this ratio slightly up or down to accommodate applications in warmer or cooler temperatures.

Important Note: Do not add any alcohol (e.g. Isopropyl Alcohol) to the slip solution.

- It is ideal to prepare and mix the Avery Dennison Application Solution Pro solution in a large pump bottle or pressurised tank with trigger spray.
- The use of Avery Dennison Application Gel is also acceptable on vertical surfaces, the Application Gel has a thicker consistency and will not easily run off the surface. The Avery Dennison Application Gel comes ready to use and should not be diluted or adjusted in any way.
- Avery Dennison Application Gel can also be an alternative to tack solution when needed.

5.1 Starting Installation

- Measure and cut the material from the roll ensuring it is at least 100 mm larger than the panel it is being applied to, make sure to remove the transparent protective cap sheet from the face of the film before beginning application if you have not done so already.
- If plotter cutting the film, ensure the transparent protective cap sheet is removed prior to cutting.
- Spray slip solution or Avery Dennison Application Gel onto the substrate before applying the film, ensuring the surface has an even and generous covering.
- Spray fingertips with the slip solution to prevent transferring any contaminants or fingerprints onto the adhesive.
- Spray the film and backing liner with slip solution prior to removal, this will help minimise static electricity and airborne contamination being attracted to the PPF.
- Remove the PET backing liner and spray the exposed adhesive side with a generous covering of the slip solution or Avery Dennison Application Gel.
- Position the material on the substrate, if necessary, slide the film until you have reached the correct positioning.
- The surface of the film should also be sprayed with slip solution throughout application to allow the squeegee to slide easily across the film and to avoid scratching or damaging the surface.
- If the film starts to prematurely tack to the substrate, additional slip solution can be introduced underneath the film to keep it from tacking.

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Once the material has been positioned, spray the surface with slip solution and gently start to squeegee the film.

Using a PPF Squeegee Pro Rigid (Blue) or PPF Squeegee Pro Flex (Red), start in the middle of the panel and gradually increase the pressure in order to remove all slip solution and air from underneath the film. Overlap the squeegee strokes by about 50% to ensure you don't miss any areas.

Work from the middle towards the outside edges of the panel, ensuring no slip solution or small air bubbles remain under the film.

Important Note: Re-positioning of the film is only possible during the initial positioning and after low squeegee pressure has been applied to the film. If done at a later stage small marks or lines might remain visible in the film surface.

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5.2 Conforming

- For curved areas, it is necessary to apply tension and firmly pull the film in order to conform it to the surface.
- It is recommended to tack a section of the film to an adjacent panel, which will provide an anchor point while you tension the film.
- Use tack solution (hot water) or a steamer to assist with adhesion at the anchor point.
- You can then pull on the film and create tension against the anchor point.
  The film should be free to slide and will begin to conform to the curvature of the surface.
- Whilst the film is under tension and held firmly in place, spray the surface with slip solution and then squeegee the area, gradually increasing the pressure.
- A small amount of heat from a steamer (30-50°C) can aid in the films conformability.
  Note: Using a heat gun is not recommended when installing PPF.

Note: Although Avery Dennison PPF is top coated and is highly resistant to cracking, care should be taken to avoid overstretching or applying too much tension, fine cracks in the top coat can result from incorrect stretching or over tensioning of the film. It is recommended to experiment with the film prior to installation to find the elongation limit of the film compared to your installation technique.

Note: Conventional convex, concave and compound curves are mostly suitable to be covered with Avery Dennison PPF, but in some deeper corrugated shapes and recesses it may be necessary to make an incision or relief cut in order to avoid overstretching the film. Ensure any incisions or relief cuts are made with a rounded cut, not straight, this will avoid any unintentional tearing of the film. Incisions or relief cuts do not jeopardize the functionality or durability of the product.

5.3 Finishing Edges

- Where the film meets an edge of a panel such as a bonnet or door, water (preferably warm) should be sprayed underneath the edges of the film to remove any residual soap solution, in order to achieve suitable adhesion.
- Once the edges have been washed with water, use firm squeegee pressure to ensure the edges adhere. It may be necessary to repeat the edge wash a second time due to residual soap solution re-entering underneath the edges of the film.
- Once the film has been applied, and all edges are firmly adhered, proceed to the finishing step by trimming any excess film.

5.4 Trimming

Important Note: It is highly recommended to practice trimming using an offcut of Avery Dennison PPF on a test panel of ACM (or similar product), prior to trimming on a vehicle. The aim with trimming PPF is to score only the top layer of the film, but not cut all the way through. This requires a certain level of skill and practicing is always recommended.

- In cooler climates (below 16°C) some additional drying time may be required before commencing trimming of the film. If you start trimming the film without sufficient drying, it may not have achieved suitable levels of adhesion. If the film shows any signs of movement during trimming then longer drying time is required.
- For optimal cutting of the film, make sure to use a new and very sharp blade: dull blades will result in rough cuts or insufficient cutting depth.
- Use light blade pressure and only score the top half of the film, an audible squeak may be heard during trimming.
- Do not apply too much pressure as you may cut through the entire film and damage the substrate.
- Once scored, break the film on an edge where cut and the excess material will easily come away from the applied material. If the film does not break away easily check your blade is new and sharp then re-trim with slightly more pressure.

6.0 Care and Maintenance

Important Note: As a final application step, re-squeegee the most critical areas (e.g. corrugations and edges) to ensure optimal adhesion to the substrate.

Avery Dennison PPF provides long-term protection of the car body during the lifetime of the product. Avery Dennison only recommends hand washing of the film. Additionally for periodic maintenance and cleaning of the film, it is recommended to use Avery Dennison Wrap Care products. Other commercially available cleaning products may be suitable but need to be tested prior to use on an inconspicuous area of the film. For further information on cleaning and maintenance of the film, please refer to Avery Dennison Instructional Bulletin 1.8 - Vehicle Wrap and Graphics Maintenance

Important Note: After initial installation, allow 24-48 hours before washing the film.

Important Note: As with all graphics films, it is important to avoid using any hard solvents (i.e. IPA (Isopropyl Alcohol) or Avery Dennison Surface Cleaner) directly on the surface of Avery Dennison PPF Material during the application process or afterwards when cleaning. Use of these products directly on the surface may cause matting, loss of gloss and prematurely degrade the film.

Within the limit of its expected lifetime and if applied on properly cured OEM automotive paint, Avery Dennison PPF can be removed cleanly. Clean removability is not warranted if the film is applied to existing graphics, improperly cured automotive paint or surface types other than OEM automotive paint. For further information on removal of pressure sensitive adhesive films, please refer to Avery Dennison Instructional Bulletin 1.07 - Removal of Decals.

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Warranty 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.

The above information provides basic information on how to apply pressure-sensitive graphics. 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 installers can be hired to ensure proper application of finished graphics. When mounting graphics in remote geographic areas, professional installers can offer the added benefit of local service.

Avery Dennison has a vast network of Certified Installers who have been specially trained and certified in accordance with our recommended techniques.

You can review the Certified Installer list here: Find a Graphics Installer

Consider hiring a professional whenever the application requires:

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

For further information, contact your local Avery Dennison representative.

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