

Application Instructions for Avery Dennison® 900 Super Cast (*New Generation*)

Application of Avery Dennison 900 Super Cast *New Generation* films has to be done in the best possible manner to ensure that the product will perform as designed for. Successful application results in an adequate bond between adhesive and substrate. Please read the instructions for surface preparation of the substrate prior to application.

1. Surface preparation:

The surface has to be cleaned by:

Washing with a mild detergent solution, after which the surface should be rinsed and dried with a lint free cloth.

Wiping with a solvent-saturated cloth, until all dirt and/or grease has been removed. The solvent should be sufficiently mild not to attack the substrate (e.g. methylated spirits).

Many commercially available cleaning/degreasing products exist: the applicator should establish the suitability of a product prior to actual use. In addition, the following factors should be considered prior to any application:

- Bare metals can best be prepared for film application by cleaning with a detergent solution, followed by solvent cleaning with a (solvent) saturated cloth. Solvents that can be used include: white spirit, heptane or other suitable degreasing solvents.
- Car wax and polish residues must be completely removed.
- Paint surfaces must be completely dry, hardened and free of scratches. On most baked paints films can be applied immediately after cooling down. Air-dried and car repair paints require at least one week to dry out before films should be applied. Solvent residues in painted substrates may adversely affect film adhesion and might cause excessive shrinkage or blistering.
- Painted substrates for self-adhesive films should be prepared according to the paint manufacturer's instruction. Here, too, it is important to avoid solvent retention. Paint system components which are not compatible or do not adhere properly to each other may cause paint to be lifted when films have to be removed after use.
- Special attention should be given to critical areas as edges, corners, welding seams, rivets and the like. One should certify himself that these areas are thoroughly cleaned and dried before application.

2. Application methods.

Avery Dennison 900 Super Cast *New Generation* films have a higher degree of conformability compared to other cast vinyls. On three dimensionally shaped surfaces Avery Dennison 900 Super Cast *New Generation* films show excellent results. The use of an industrial hot-air tool will improve

the ease of application. 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 900 Super Cast *New Generation* films are designed for dry application to prepared surfaces. Although not recommended it is possible to apply Avery Dennison 900 Super Cast *New Generation* films using the "wet method". In the next 2 paragraphs both methods will be explained.

2.1 Dry Application Method.

Using the dry application method it is an absolute must to use application tape. The application tape should be laminated over the graphic for the ease of positioning and to protect it against stretching and scratching. Hereafter this newly formed laminate will be referred to as film.

Application surfaces.

In this bulletin 5 surface shapes (see product datasheet Avery Dennison 900 Super Cast *New Generation*) will be referred to with short descriptions and instructions.

Concave shaped surfaces:

This hollow or bowl-shaped form implies that the material will be laid into a rounded or curved-in surface. Position the film over the total surface area as explained in our Technical Bulletin 1.4. Remove (a part of) the liner and apply the film on the surface with the help of your thumb or a squeegee. Remove the application tape and start working the film into the hollow shape. If convenient, some heat can be applied to soften the film thus making the inlay process easier. The applied temperature should be in the range from 35 ° to 50 °C. The use of hand gloves (dry or slightly wet) will make this process easier. Gently follow the form of the substrate till all the material has been positioned.

Apply heat over the total area, especially over the concave part in order to allow the film to take permanently the shape of the substrate. The stretched parts of the film should be re-heated in a temperature range of 80° to 90°C. Let the film and the substrate cool down till room temperature prior to any cutting of edges or overlays, etc.

Convex shaped surfaces:

This curved or rounded shaped form implies that the material will be stretched around a curved-out surface. Position the film over the surface area as explained in Technical Bulletin 1.4.

Remove (a part of) the liner and apply the film on the surface with the help of a squeegee. Move around the convex area and come as close as possible with gentle strikes till no further stretch of the film occurs anymore or greater amount of air will remain trapped. Remove the application tape and start shaping the film with a felt squeegee or use hand gloves making gentle movements around the area. Remove air entrapment by punching small holes in the film and if convenient, some hot air can be used making the film more conformable. During the conforming process the applied temperature should be in the range from 35 ° to 50 °C.

After having completed the application, apply more hot air to the film in the temperature range of 80° to 90° C over the convex area and apply pressure again in critical areas using a squeegee covered with felt or hand gloves.

Let the film and the substrate cool down till room temperature prior to any cutting of edges or overlays, etc.

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. The method of application is conform the description of the two individual shapes in the

former two paragraphs.

Corrugated surfaces:

Position the film to the application surface with a masking tape that can serve as a hinge (see Technical Bulletin 1.4). Ensure that the hinge is in a flat section of the surface. Only remove a small area of liner to prevent pre-sticking.

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 pleats, which are sometimes difficult or even impossible to be eliminated.

Start the application at the hinge (continue section by section) and apply the film from the centre to the film or graphic edges. This method will limit the occurrence of pleats.

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. Remove the application tape after 3 to 5 minutes and re-squeegee the edges or corners.

Riveted surfaces:

Position the film to the application surface with a masking tape that can serve as a hinge (see Technical Bulletin 1.4). Ensure that the hinge is in a flat section of the surface. Only remove a small area of liner to prevent pre-sticking

Start the application at the hinge and work towards the edges of the film or graphic. When a rivet is reached, push the film towards the rivet head with the squeegee and apply the film leaving an air "bubble" around the rivet. Maintain sufficient tension in the film to prevent pleats around the rivets. Once the film part or graphic has been applied (with the application tape still in place), punch with a needle some 4-5 holes around the rivet and proceed to apply the film with a plastic squeegee. After this stage has been completed remove the application tape. Gently push the air out of the entrapment by hand using gloves or with a soft squeegee. Apply heat to the film around each individual rivet with a portable hot-air tool until the film softens. It is advisable to use a temperature range of 35° to 50° C. Push the film further into shape around the rivet with the thumb (using gloves) or a felt covered squeegee.

Eventually the film can moulded around the rivet head by means of a brush, using circular movements. Be aware to apply the pressure of the brush on the film only at room temperature and avoid scratching the surface. Complete the application by applying hot air to the film using a temperature range of 80° to 90° C. Check and re-squeegee the edges of the rivets of the applied film or graphic, where required.

2.2 Wet Application Method.

This application method is recommended for flat surfaces only. Do not use on concave, convex or compound shaped surfaces.

By wetting the surface with a 1% detergent solution in water the film can be positioned on the substrate without adhering to it. The detergent liquid provides slideability and positionability to the pressure sensitive film until the water film has been removed. A plastic squeegee can be used for the removal of the water layer. Start squeegeeing from the center towards the edges of the film or graphic and gradually increase the applied force till apparently most all the water has been removed. Repeat this process several times.

The advantage of the wet application method is that during application the film can be applied without the use of an application tape. However adhesive built-up via this application method will take much longer than under dry conditions. In general this means longer application times for certain areas since drying has to occur prior to the finishing touch of a job.

If an application tape has been used on the film it is advisable to check on the built-up of adhesion

at the edges in order to determine the right moment for removal of the tape. This time span can be from 1 hours up to 6 hours, depending on the kind of substrate or the wetness of the application tape, etc. Too early removal may cause lifting of the film from the substrate and consequently permanent surface imperfections or bubbles may be introduced.

Note:

-On riveted, concave and compound shaped surfaces the wet method should not be used. Water will be encapsulated which is impossible to be removed totally. In a later stage often causing lifting of the film in rims, edges and compounded curves.

-On convex surfaces the delay in adhesive built-up may jeopardize the overall performance of the product during its final product utilization.