TECHNICAL BULLETIN 5.8

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Preparation and Application of Avery Dennison® MPI™ Wall Film Series

Application of Avery Dennison MPI Wall 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.

Prior to application or lamination, prints must be sufficiently dried, in order to prevent negative influence on film properties or adhesion properties. In general a drying time of 24 hours (full solvent) or 48 hours (eco-/mild solvent) will be sufficient. In case a lot of ink is deposited, materials may need up to 72 hours in order to be sufficiently dry. When drying, material should **not** be tightly wound on a core, as the solvents are then unable to evaporate. The materials should be left drying loosely wound on a core, or stacked in racks as sheets. Properly dried images are always needed in order to benefit from each product's specific feature.

As with any application there are specific considerations necessary for wall graphics. Products or application materials not specifically addressed in this bulletin, or in related bulletins are NOT recommended or warranted by Avery Dennison.

Surface preparation

Proper cleaning and preparation of substrate prior to graphic application is critical to the success of the graphic. The following cleaning and surface preparation conditions must be followed prior to application. Failure to adhere to these requirements can cause adhesion loss and therefore reduce the durability and performance level of the printed graphic. The following conditions are relevant to properly prepared paint systems processed correctly per paint manufacturer specifications.

The required wall texture for successful graphic application and adhesion is smooth, if necessary properly primed, painted, and cured wallboard that has little or no surface variation. Only wall film products with specialty adhesive (referred to as Hi-Tack adhesive) are also recommended to apply on more difficult substrates such as plastered walls, treated wood or low-energy surfaces such as latex painted walls.

NOTE: 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 graphic failures and/or removal problems.

These are general recommendation for painted surfaces. It is essential to follow manufacturer's directions for complete surface preparation and adequate drying/curing time prior to graphic or film application.

Paint Surface Definitions

- Flat (or matte) paints provide a non-reflective surface and they have a porous texture that can hold onto dirt and make cleaning more difficult. The porous surface of flat paint makes application of Adhesive films much more difficult due the inability to adhere to the surface. This causes the adhesion of the film to the painted surface to be greatly reduced causing premature failure of the graphic.
- Satin or low luster paints, are more lustrous than flat finishes. While these surfaces are not as porous as a flat paint the matting agents used in these paints can negatively affect the ultimate adhesion of the graphic.
- Semi-gloss paints provide a smooth somewhat shiny finish, which provides a good surface for graphics application.
- Glossy paints provide a smooth shiny finish, which provides a good surface for graphics application. Gloss painted surfaces are the best surfaces for graphics application.

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CAUTION: Avoid the use of the following paint finishes; always test adhesion and paint/ adhesive compatibility prior to production use.

- Only use dedicated wall film products with specialty adhesive (Hi-Tack adhesive reference) for application on flat or matte finishes. The matting agents in these paints can reduce film adhesion and cause the graphics to fail when standard adhesive products are used. Please note that in order to ensure good adhesion values to these difficult surfaces, the adhesion force on these products is very high and adhesive split/ larger amount of adhesive residue on the surface might be perceived.
- Avoid Paints containing migratory agents, such as chlorinated waxes and silicones, which may cause adhesion failure.
- Avoid heavily textured paints. The texture will allow the film to adhere only to the “high spots” greatly reducing the graphic adhesion, which could cause graphics to fail prematurely.
- Avoid all latex paints on wooden substrates.
- Avoid oil alkyd primers and enamels, as they are slow to dry and will adversely affect adhesion of a film.
- Avoid applying to wallpaper.

Paint and Paint Surface Precautions

- If applying film to a newly painted surface, follow all drying, and curing instructions provided by the paint manufacturer prior to surface preparation and film application.
- All air-drying paints should be allowed to dwell at near room temperature and humidity conditions for at least one week (7 days) prior to film application. Reference paint manufacturer’s instructions for actual curing time of the paint. **NOTE: It has been documented that some paints can take months to fully cure.**
- Chalked and otherwise weathered paint surfaces must be refurbished.

NOTE: Always test adhesion and paint/adhesive compatibility prior to production use. Adhesion can be tested by applying a small strip of film in an inconspicuous area and allowed to dwell for 2-3 days. Before applying the test strip the wall should be properly prepared as outlined below.

Inspecting, Cleaning And Preparing the Substrate

The surface to which Avery Dennison™ films are applied must be completely clean, smooth, and dry before final preparation. Before graphics can be applied it is important to make sure the substrate is both in good condition and clean. Any contaminates such as dust, dirt, grease, or defects on the substrate such as loose paint can cause adhesion loss and therefore reduce the durability and performance level of the graphic.

Inspect / Repair Substrate

It is important to repair any wall damage and return it to like new condition. A wall that is not properly repaired could cause poor graphic adhesion or additional wall damage during removal of the graphic. Examples of an unsound wall surface include loose paint, damaged surface, cracks, or inconsistent surface.

Below are several examples of walls in need of repair.

- Holes in wall or incomplete patches – These areas will need to be patched, primed, and painted.
- Loose wallboard joints – These seams must be repaired.
- Too much texture in the paint – The surface may be smoothed down with sandpaper or scouring pad. Walls must be primed and painted after this is completed.
- Paint chipped, loose, flaking or peeling – Scrape away all loose paint and then prime and paint the surface.
- Moisture behind the wallboard – this can cause the wallboard paper to release. Pay special attention to areas prone to condensation such as walls surrounding cooling units, water pipes, overhead windows, or any water pipes that could drip on the graphic.
- Dust, dirt, or vehicle exhaust contamination on the wall – The walls musts be clean and free from dust, dirt, grease and other contaminates before applying the graphics.
- Wallpaper that is not securely bonded to the wall in all areas – It is recommended that graphics are not to be applied over wallpaper.
- Contamination by other products on the wall that was not properly cleaned.
- Cuts made to the graphic during the installation that penetrates both the film and substrate.

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Cleaning

- Clean the wall prior to applying any wall film.
- For most interior painted drywall surfaces simply wiping down the substrate with a clean lint free towel will be sufficient. However, some surfaces may require extra cleaning. If the surface is greasy using a solution of trisodium phosphate (TSP), mixed according to the manufacturer's directions, may be necessary. (TSP can be purchased at most hardware stores).
- For surfaces other than painted drywall remove all dirt and grime with a commercial synthetic detergent solution and warm water. Avoid detergents with lotions, waxes, creams, or oils. Be aware some window cleaners have waxes.
- Smooth poured concrete walls or concrete block walls (interior only)
- It may be necessary to clean with a power washer or hand wash with a stiff brush and detergent and rinsed with clean water. This will help remove any grease or exhaust contaminants on the wall.
- Dry the surface with clean, lint-free paper towels.
- The surface should be allowed to thoroughly dry for at least 24 hours before graphics are applied.

- After the surface has dried, it is recommended to brush the surface immediately before application to remove any dust or dirt that may have collected during the drying period.
- Too much surface texture allows adhesive contact only with the high points of the wall, which does not provide sufficient contact for a proper application.

Preparing Substrate / Painting Recommendations

- For a smooth paint surface use a short nap roller (approximately 5mm), a sponge roller or spray unit to apply paint.
- Prime the wall with a primer that is compatible with the paint to be used. It may be necessary to apply two coats of printer to ensure good coverage. Reference manufacturer's instructions for recommended time between coats.
- Paint the wall with a quality, semi-gloss or gloss paint.
  NOTE: Do not use matte paint or paint with silicone, graffiti-resistant or texturizing additives in combination with the MPI 8621 Wall Film Removable.
- Allow the final coat of paint to dry for at least 5 days before applying graphics to the wall. Reference the paint manufacturer's instructions for actual cure time of the paint.
- Do not apply graphics to any wall that does not have excellent paint to substrate bonding.

NOTE: If the paint is not allowed to cure properly outgassing may occur. Outgassing takes place during the drying/curing process of the paint where certain gases are released. If a graphic is applied before the paint is allowed to cure these gasses will become trapped and can result in lifting, air bubbles and premature graphic failure. **When possible, Avery Dennison recommends using primer and paint from the same manufacturer, since the products are usually designed to work together. The goal is to achieve a good bond between the substrate, primer, and paint. Avery Dennison does not endorse any particular paint manufacturer. It is also recommended test painted surface before applying graphic.**

Application

Application Tools

- Masking tape – for positioning
- Lint free cleaning cloths – for cleaning the substrate
- Tape measure – for positioning
- Air release tool – for removing air bubbles
- Marking pencil – for marking position of graphic
- Squeegee – for applying the graphic
- Rivet brush – for working film into textured surfaces.
- Razor-knife (preferably one with break-off blades) – for trimming away excess vinyl
- Heat gun – for heating the vinyl on complicated applications
- Surface Temperature Thermometer / IR Thermometer – for checking surface and ambient temperature

Temperature

Temperature plays an important role in how well a vinyl sticks to a substrate. Follow the guidelines toward minimum and maximum application temperatures and required service conditions before and after application. This information can be found in the Data Sheets for each film being used.

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Note: It is important to monitor both the ambient and surface temperature as both can have an effect on the application. Higher temperatures will make the film soft and more pliable. However, the high temperature also makes the adhesive more aggressive, which can lead to pre-tack and increased stretching if it is necessary to reposition the film. Lower temperatures will make the film more rigid and reduce the tack of the adhesive.

Ambient Air Temperature - Air temperature of environment (i.e. the room where application is taking place).

Surface Temperature - Temperature of wall (i.e. the surface where graphics are being applied).

Application Guidelines

Make sure that the film is appropriate for the intended application. Always test adhesion and paint/adhesive compatibility prior to application

Application Notes

- Before installing the graphic, unroll it and allow to lay flat. Allow the material to relax and reach room temperature for at least one hour prior to application.
- Premask/ Application Tape is not necessary or recommended for wall graphic applications.
- Before starting the application use masking tape to temporarily tape up all panels to ensure graphic size and position.
- When handling the graphics, be sure to hold the film as far into the graphic as possible, without wrinkling the film.
  This will help avoid transferring oil from fingers and dirt to the edges of the graphic, which could result in peeling edges or lifting, which can cause adhesion problems.
- Use two hands when pulling the liner from the film, using care not to stretch the film.

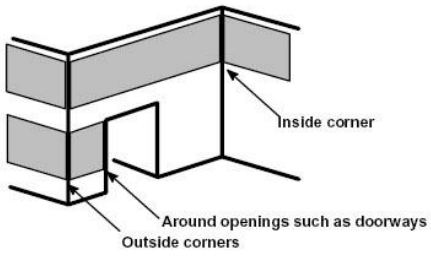
NOTE: Always remove the liner from the graphic rather than the graphic from the liner.

- Pull the squeegee or rivet brush across graphic. Pushing it will cause the film to stretch.
- Move the squeegee or rivet brush in a straight line-not in an arc.
- Use firm, overlapping strokes.
- Once the graphic is applied:
- Re-squeegee all of the edges of the graphic to help ensure good adhesion. This will reduce the risk of damage and lifting at the edges of the graphic.
- Trim graphics 1 cm from inner and outer wall corners.
- Finish the graphic by working a rivet brush in small circles around the entire outer 7 cm of the graphic.

Application Method
When applying wall graphics the “dry application method” must be used. Do not use application fluid or the “wet method” during installation. Water or application fluid can cause damage to the wall and cause premature graphics failure.

Overlap of Multi-Panel Graphics
When overlapping multi-panel graphics, the actual overlap should be at least 13mm.

Trimming Requirements
Areas of the graphic around doors, openings, outside and inside corners of walls, and high traffic areas are susceptible to damage. To reduce the risk of damage and lifting of the graphic, it is important to trim the graphic approximately 5 mm from the edge of the graphic.
After application and trimming it is necessary to brush the edges with a rivet brush to ensure good adhesion of the graphic edges.



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Graphic Removal
Avery Dennison does not warrant damage to the interior wall surface caused by removing film even if a removable adhesive was used. Removing a graphic can cause damage to the wall. This is especially true if a specialty adhesive is used. Due to the variety of wall surfaces Avery Dennison Graphics cannot guarantee damage free removal. The amount of damage can be reduced or eliminated by following the inspection, cleaning and preparation guidelines provided at the beginning of this bulletin.

Graphics removal

Removable Films (MPI 8621 Wall Film Removable)
Removable adhesives are designed to make the film removal cleaner and easier within a warranted period. The removability of a film very much depends on the substrate and how it was prepared. It is recommended to test a sample of the film on the specific substrate intended to be applied.

Specialty adhesive Films (MPI 8726 Textured Wall Films, MPI 8024 Wall Film EA Hi-Tack and MPI 8626 Wall Film Hi-Tack)
Permanent specialty adhesives are designed to provide optimum adhesion to a variety of substrates. They are generally difficult to remove and may cause damage to some wall surfaces. Films with permanent adhesives are a good choice for difficult wall surfaces (as described under Paint Surface Definitions).