

1.0 Scope

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

2.0 Cleaning and Preparation

2.1 Pre Cleaning Recommendations (before preparation)

The surface to which Avery Dennison™ films are applied must be completely clean, smooth, and dry before final preparation.

- ? Remove all dirt and grime with a commercial detergent solution and water.
- ? If grease, oil, wax, etc., are present, the substrate must be scrubbed with a solvent wipe (Xylene, heptane, ethylacetate, *isopropyl alcohol*).

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

2.2 Final Surface Cleaning and Preparation

- ? After proper cleaning, the substrate surface should be thoroughly wiped by using a clean rag saturated with a cleaner such as DuPont's Prep-Sol Brand Solvent 3919S, Rapid Prep by Rapid Tack, or Sherwin Williams R7K-156. NOTE: Other solvents such as IPA (isopropyl alcohol), VM&P Naptha, Xylol, or lacquer thinner may also be used instead of DuPont 3919S. However, care should be taken to assure that the final dry wiping is accomplished prior to the solvent evaporating.
- ? After thoroughly wiping with cleaner, dry wipe the surface completely using a clean, soft, lint-free cloth before solvent evaporates. NOTE: There must be no dirt, oil, grease or solvent residue remaining on the substrate prior to decal application.

3.0 Special Instructions for Specific Surfaces

3.1 Painted Surfaces

3.1.1 Non Recommended Paint Surfaces

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

- ? Avoid highly pigmented or flat metallic paints which tend to chalk and flake promoting poor film adhesion.
- ? Avoid flat latex paint.
- ? Avoid all latex paints on wooden substrates.
- ? Paints containing migratory agents, such as chlorinated waxes and silicones which may cause adhesion failure. Avoid oil alkyd primers and enamels, as they are slow to dry and will adversely affect adhesion of a film.

3.1.2 Paint and Painted 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.

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- ? All air drying paints should be allowed to dwell at near room temperature and humidity conditions for one week prior to film application.
- ? Baked enamel paints may be used directly upon cooling.
- ? Application of retroreflective film to zinc chromate primer or zinc rich primer is not recommended.
- ? Chalked and otherwise weathered paint surfaces must be refurbished with buffing, followed by substrate preparation and cleaning instructions as specified in Section 2.0 above.
- ? Some paint systems provide an extremely smooth surfaces, hence, initial adhesion will be low, extra dwell time is necessary before maximum adhesion is achieved.
- ? Any section of painted metal with bare or rust spots should be entirely resurfaced.
- ? Non film covered portion of painted metal should have a minimum of one finish coat.

3.1.3 Recommended Paint Surfaces

NOTE: Always test adhesion and paint/adhesive compatibility prior to production use.

- ? The use of high quality exterior grade paints and OEM systems are recommended, followed by substrate cleaning and preparation instructions as specified in Section 2.0 above.

3.2 Tin or Alloys of Tin, Copper, Magnesium, Lead and Brass

- ? Not recommended or warranted for pressure sensitive film applications.

3.3 Stainless Steel

- ? The use of high quality exterior grade paints and OEM systems are recommended, followed by substrate cleaning and preparation instructions as specified in Section 2.0 above.
- ? Stainless steel substrates tend to maintain cold surface temperatures longer than most substrates. The use of a weed burner immediately before and after application accelerates bond, be sure to clean any carbon residue caused by the weed burner prior to film application.
Note: Application of Avery Dennison™ PX metalized films (PX 1070, 2070, 1071, 2071, 1076, 2072) and all retroreflective series films (unless specifically designed for stainless steel use) to bare stainless steel substrates is not recommended or warranted.

3.4 Unpainted Fiberboard and Unpainted Wood

- ? Generally not recommended for pressure-sensitive film. Contact Avery Dennison™ Customer Technical Support for additional information.

3.5 Galvanized Steel

3.5.1 Confirming Proper Steel Galvanizing

- ? To ensure the substrate is properly galvanized, it is recommended to test all lots of galvanized steel. The following prepared solution is recommended:
Caution: Follow all manufacturers' recommended procedures and safety recommendations. Refer to the container label and the Material Safety Data Sheet for health and safety information.
- ? Prepare 1 molar solution of Cupric Sulfate (25g of CuSO₄ mixed in 1 liter of deionized or purified water).
- ? Apply solution to the substrate using a clean dry rag. Surface is properly galvanized if solution turns 'black', continue with preparation procedures (Section 3.5.2).
- ? A resulting 'copper' color indicates lack of galvanizing, do not use steel sheet.

3.5.2 Preparation of Galvanized Steel Sheeting

- ? Remove any zinc oxide, zinc hydroxide, and the like from the surface by mechanically brushing the surface with a plastic abrasive pad.

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- ? Degrease with a petroleum-distillate solvent such as Heptane, wipe surface with a clean dry cloth.
- ? Wipe surface with IPA, and dry with a clean dry cloth before the solvent evaporates.

3.5.3 Special Conditions for Retroreflective Film Applications to Galvanized Steel

- ? For retroreflective film application, the surface must be primed and painted.
- ? If metal is to be completely covered with film, a primer coating is generally sufficient on a smooth surface. Application of retroreflective film to zinc chromate primer or zinc rich primer is not recommended.
- ? Retroreflective film must be sealed around all edges.
- ? Reflective films with heat activated adhesives must be edge sealed and clear coated to prevent surface moisture penetration.
- ? Portion of painted metal not covered by film should have a minimum of one finish coat.

3.6 Aluminum

NOTE: It is recommended to use etched aluminum surfaces only.

- ? The use of high quality exterior grade paints and OEM systems are recommended, followed by substrate cleaning and preparation instructions as specified in Section 2.0 above.

3.7 Polycarbonate (i.e. Lexan®)

- ? Using a soft, clean, lint free cloth, solvent wipe the surface with IPA, wipe substrate dry before the solvent evaporates.
- ? Follow polycarbonate manufacturers drying and preparation instructions. Failure to properly prepare polycarbonate before film lamination may result in severe air bubbles trapped between the film and substrate sheeting.
- ? Test for outgassing by applying a small sample of film intended to be used to the polycarbonate, then oven bake the applied sample for 18 to 24 hours at 149°F to 158°F (65°C to 70°C). Resulting bubbles under the film indicates outgassing. If outgassing occurs, application of Avery film to the polycarbonate is not recommended or warranted.

3.8 Acrylics, and other Acrylates (i.e. Plexiglas®)

- ? The use of high quality exterior grade paints and OEM systems are recommended, followed by substrate cleaning and preparation instructions as specified in Section 2.0 above.

3.9 ABS

- ? The use of high quality exterior grade paints and OEM systems are recommended, followed by substrate cleaning and preparation instructions as specified in Section 2.0 above.

3.10 Fiberglass

- ? Using a soft, clean, lint free cloth, solvent wipe the surface with IPA, wipe substrate dry before solvent evaporates.
- ? Follow manufacturers curing and preparation instructions. Failure to properly prepare before film lamination may result in severe air bubbles trapped between the film and substrate sheeting.
- ? Test for outgassing by applying a small sample of film intended to be used to the fiberglass, allow to dwell at room temperature for 24 hours or oven bake for 3 hours at 149°F (65°C). If bubbles appear, outgassing is occurring. Cure the fiberglass for 5 days at 140°F (60°C). Repeat outgassing test.

I n s t r u c t i o n a l B u l l e t i n

3.11 Glass Preparation

- ? Glass must be perfectly clean. Remove any tape, stickers, paint, or stain overspray, using a single edge razor blade scraper and/or a 4" razor blade scraper (available at most hardware stores). NOTE: Wetting the glass with cleaning solution (DuPont Prepsol or Isopropyl Alcohol) will reduce the chance of scratching the surface during the scraping process. Use a fresh blade for each job. Check the blade for imperfections which may cause scratches.
- ? Once the glass has been scraped clean of contaminants, use the 4" razor to scrape the glass again, removing any remaining residue.
- ? Spray the glass with cleaning solution, squeegee it dry using a soft rubber window squeegee. Wipe the edges dry using lint-free paper towels.

Revisions have been italicized.

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