GENERAL FORMULATIONS

AUTOMARK™ VEHICLE WRAP APPLICATION GUIDE

INTRODUCTION

General Formulations® (GF) manufactures a portfolio of high-quality, durable, and conformable print vinyl and matching laminates specifically designed for a variety of vehicle wrap applications. All GF AutoMark™ products are manufactured with distinctive performance characteristics, features, and benefits meeting the requirements and challenging demands of vehicle wrap applications. Below you will find a comprehensive guide outlining the critical parameters to follow when printing, laminating, pre-inspection, preparation, installation and post-installation.

PRINT MEDIA AND LAMINATES

Premium Cast Wrap Products:

GF 830 AUTOMARK™ CAST WITH DRIFT® TECHNOLOGY
2.0 mil gloss white cast wrap vinyl, grey solvent slidable, repositionable, long-term removable adhesive, 106# air egress layflat liner

GF 813 AUTOMARK™ HIGH GLOSS CLEAR UV CAST LAMINATE
1.3 mil cast clear laminate, clear solvent permanent adhesive, 74# liner

GF 831 AUTOMARK™ GLOSS CLEAR UV CAST LAMINATE
2.0 mil cast clear laminate, clear solvent permanent adhesive, 74# liner

GF 840 AUTOMARK™ MATTE CLEAR UV CAST LAMINATE
2.0 mil cast clear laminate, clear solvent permanent adhesive, 74# liner

GF 844 AUTOMARK™ ULTI-MATTE CLEAR UV CAST LAMINATE
2.0 mil cast clear laminate, clear solvent permanent adhesive, 74# liner

High-Performance Calendared Wrap Products:

GF 230 AUTOMARK™ GLOSS WHITE CONFORMABLE VINYL
2.4 mil white polymeric wrap vinyl, opaque repositionable grey adhesive, 90# air egress layflat liner

GF 333 AUTOMARK™ DRIFT® PW GLOSS WHITE POLYMERIC VINYL
3.0 mil white polymeric wrap vinyl, opaque grey slidable repositionable adhesive, 105# air egress layflat liner

GF 231 AUTOMARK™ GLOSS CLEAR UV LAMINATE
2.4 mil clear polymeric wrap laminate, permanent adhesive, 53# liner

GF 240 AUTOMARK™ MATTE CLEAR UV LAMINATE
2.4 mil clear polymeric wrap laminate, permanent adhesive, 53# liner

MEDIA SELECTION

General Formulations offers a variety of print vinyl and laminates specifically engineered for use in most vehicle and fleet wrap applications. This includes full and partial wraps, as well as long-term signage, graphics, and decals. It is important to select the correct product combination for optimal performance.

A cast print vinyl and laminate combination is recommended for vehicle wrap applications where ultimate conformability, stability, and durability are required. This includes applications with convex, concave, and compound curves as well as recessed channels.

General Formulations also offers high-performance polymeric calendered print vinyl's and laminates suitable for less demanding vehicle wrap applications with simple curves and flat surfaces.

It is important to reference the product Technical Data Sheet (TDS) to ensure the product chosen meets all application parameters. You can find this information at www.generalformulations.com/technical-data-sheets.

PRINT VINYL AND LAMINATE COMBINATIONS

PRINT VINYL	GF 830 AUTOMARK™ CAST WITH DRIFT®TECHNOLOGY™	GF 230 AUTOMARK™ WRAP VINYL	GF 333 AUTOMARK™ DRIFT® PW WRAP VINYL
LAMINATE	GF 831 AUTOMARK™ CAST GLOSS WRAP LAMINATE GF 840 AUTOMARK™ CAST MATTE WRAP LAMINATE GF 844 AUTOMARK™ CAST ULTI-MATTE WRAP LAMINATE GF 813 AUTOMARK™ CAST GLOSS WRAP LAMINATE	GF 231 AUTOMARK™ GLOSS LAMINATE GF 240 AUTOMARK™ MATTE LAMINATE ALL CAST LAMINATES	GF 231 AUTOMARK™ GLOSS WRAP LAMINATE GF 240 AUTOMARK™ MATTE WRAP LAMINATE ALL CAST LAMINATES

RECOMMENDED APPLICATIONS

Below is a list of suitable applications for which these products were intended. This includes but is not limited to vehicle and fleet wrap applications, as well as long-term signage and decals. It is important to select the correct product combination for optimal performance. Please refer to the product TDS to determine which product combination is best for your application. Depending on the GF series chosen, below are the intended applications:

- Commercial Vehicles (Vans, Box Trucks & Fleets)
- Recreational Vehicles
- Personal (Cars, Pick-up Trucks, etc.)

IMPORTANT: Please refer to the **UNSUITABLE USES** for unsupported surfaces on **page 6**.

PRODUCT COMPATIBILITY & DURABILITY

PRINT VINYL	GF 830 AUTOMARK™ CAST WITH DRIFT®TECHNOLOGY™	GF 230 AUTOMARK™ WRAP VINYL	GF 333 AUTOMARK™ DRIFT® PW WRAP VINYL
LATEX / RESIN	EXCELLENT	EXCELLENT	EXCELLENT
ECO-SOLVENT / SOLVENT	EXCELLENT	EXCELLENT	EXCELLENT
UV / UV GEL	EXCELLENT	EXCELLENT	EXCELLENT
CONFORMABILITY	EXCELLENT	GOOD	FLAT ONLY
COMMERCIAL VANS / TRANSIT - CHANNELS / RECESESS	EXCELLENT	GOOD	FLAT ONLY
TRUCKS - FLAT & SIMPLE CURVES	EXCELLENT	EXCELLENT	EXCELLENT
RIVETS*	YES	YES*	NO
ABRASION RESISTANCE	EXCELLENT	EXCELLENT	EXCELLENT
REMOVABILITY W/HEAT	EXCELLENT	EXCELLENT	EXCELLENT
OUTDOOR DURABILITY**	8 YEARS**	7 YEARS	7 YEARS

**Please refer to the TDS for additional product compatibility.*

***Please refer to the TDS for additional product durability statements.*

WIDE FORMAT DIGITAL INKJET PRINTING

General Formulations Digital Print Media is formulated and developed for optimal ink receptivity with Solvent, Eco-Solvent, UV Curable, UV Gel, and Latex/Resin printers.

- It is important to use the correct General Formulations ICC Profile to ensure consistent color output and to prevent over saturation of inks which can affect overall performance of the vinyl and laminate combination. Printers should be properly maintained and calibrated for optimal performance per the manufacturer recommended specifications.

SPECIAL NOTE FOR LATEX / RESIN INKS

- Inks must be fully cured according to the manufacturer's specifications to prevent laminate failures. Bond of the adhesive to the latex / resin inks using the "overcoat/clear coat" option, can cause an adhesive bond failure. Properly deactivating the overcoat/clearcoat in the software or printer panel would be recommended for the best adhesive bond of the laminate.

- Please refer to the official documentation of the printer model, manufacturer model/series and ink configuration for more information.

ICC Profiles can be downloaded from: www.generalformulations.com/profiles

Please use general printing practices. Below are some recommendations:

- Eco-solvent and solvent inks are recommended to dry at 60°F - 75°F (15°C - 26°C) at 50% relative humidity for 48hrs - 72hrs prior to lamination.

- Depending on saturation of the vinyl (darker images), non-cured/dried inks can adversely affect performance that can lead to failure.

- Drying/curing times may vary depending on environmental conditions, even if the ink appears to be dry, retained solvents can still be present and will continue to outgas.

- Retained solvents or excessive solvents can affect vinyl and laminate adversely.

Lamination process:

It is recommended to use industry standards for lamination after the inks are cure/dried.

- NIP pressure (Roll down force)
- Speed (Dwell)
- Tension (Slack between film and releasing liner as its laminated to the surface of the printed vinyl)

Note: Application or roller tables with different configurations may not have adequate down force pressure. Please consult the table manufacturer for more recommendations.

PRE-APPLICATION CHECKLIST

Prior to any application, refer to the following list.

- Any vehicle or fleet wrap or graphics should be applied indoors in a climate-controlled environment. Outdoor applications can be challenging with temperature, moisture, wind, and dust, etc. These conditions will affect the characteristics of the engineered adhesives.

- The vehicle and environment temperature should be between 60°F - 75°F (15°C - 26°C) prior to any application.

- Ensure the vehicle has been kept indoors overnight in a properly maintained environment within recommended temperatures and all surfaces have been thoroughly cleaned and dried.

- Prior to any application, a determination needs to be made by the installer if the removal of any mirrors, door handles, badging, antennas and or lighting fixtures is needed for a proper application. Keep in mind commercial versus personal use and possible unsupported surfaces.

- Identify possible points of failure which may include (but is not limited to) improperly painted surfaces, clear coats, chipping, rust, dents, nicks, scratches, seams, silicon seals, and rubber gaskets. Adhesives are designed to adhere to painted (OEM) vehicle surfaces.

- Any surfaces with ceramic coatings and or ceramic waxes must be removed prior to any application. These ceramic products will prevent proper overall adhesion. Professional help may be needed to safely remove any ceramic coatings without damaging the OEM painted surfaces.

- The use of clean "filtered" compressed air or a heat gun will be helpful to fully force dry any water left behind after washing the vehicle. Not fully drying any surface may impede a complete and proper installation thus inducing possible edge wing-up and or edge lifting.

- Wipe down the entire surface thoroughly with IPA (Isopropyl Alcohol, 70% concentration minimum) prior to application. The use of towels may contaminate the surface while the final wipe down with IPA is completed. It's recommended to use a quality microfiber towel while changing them out frequently to ensure a thoroughly cleaned surface.

- Give extra attention to any edges and seams around moldings, gaskets, fixtures, door jams, hoods, and trunks where these objects have been removed. Make sure these areas are clean and debris free.

- Check for proper graphic alignment before any application is started. Special care should be given to all seams, door handles, windows, pillars, mirrors, and trim/side moldings.

RECOMMENDED TOOLS FOR VEHICLE WRAP APPLICATIONS

- Adjustable industrial heat gun
- Quality knife with ample replacement blades
- Air release tool
- Quality wrap gloves
- Quality masking tape (1"-1.5")
- IR thermometer
- A hard and soft squeegee

APPLICATION RECOMMENDATIONS

- Application begins at the back of the vehicle for vertical panels and from the bottom up for horizontal panels. This allows for all overlaps to face the back or bottom to prevent wind and rain from causing a premature failure. Seams should have a 0.50" - 0.75" (1.27 cm -1.905 cm) overlap.

- Use firm consistent even pressure with a squeegee when applying the media. Starting at the high points in the middle and working outwards while pushing any air from the back side of the vinyl. Techniques may vary.

- For channels, wherever possible, lay the media down through the channel rather than bridging and stretching the media. Any vinyl film (cast or calendered) can exhibit shrinking or tenting when overstretched, overheated, and/or stressed.

- In some instances, it is not possible to negotiate complex curves. In this case, you may need to bridge the vinyl (cast only). Be sure not to overstretch the cast vinyl and laminate combination. Post heating these areas is a must.

- Overstretching may result in post memory failure causing edge lifting, edge wing up and/or channel popping.

- At this point, it is suggested to cut the vinyl in these areas to relieve tension. This technique is known as "drop in". This reveals an area that will not have vinyl applied.

- Any edge or seam should be cut/trimmed and re-squeegeed to ensure proper adhesion. It is recommended to use heat along these areas to help build adhesion. This step is sometimes overlooked causing undue edge wing-up and/or failures.
- Applications over rivets may tent and is not considered a warranted claim. Heat setting rivets will help eliminate tension or stress and promote quicker adhesive bond.
- It is still possible to induce an occasional bubble, in this case, the installer should first use the "thumb technique" to eliminate the trapped air. If the adhesive is fully wet out, the use of an air release tool may be needed. DO NOT use a knife as this can start a tear over time, which can result in the vinyl splitting.

POST HEATING

After the vinyl has been applied, the installer will need to go back and post heat the vinyl at the recommended temperatures to reset the vinyl memory. It's recommended to use a quality infrared thermometer (IR Gun). The temperatures can range from 190°F to 250°F (87° - 121°C). This depends on the GF series or product chosen for the application. Please keep in mind the surface characteristics. They can affect the heat or time needed to get the film up to the desired temperature. See the individual product TDS document for more details at www.generalformulations.com/technical-data-sheets.

Special Note: Since vinyl can cool quickly, it is important to work in small areas and continue to heat the vinyl. To eliminate any vinyl stretching or stress, the installer must heat the film between 220°F - 250°F (104°C - 126°C).

Post application inspection:

After the application is complete, it is vital to make sure the finished wrap or installation has had 12 to 24 hours for the adhesive to achieve full wet out or ultimate adhesive bond to the surface. Please note the surface/vehicle environment needs to remain at the same application temperature of 60°F-75°F (15°C-26°C) for a minimum of 12 hours and ideally 24 hours. If the vehicle/surface does not have adequate time to achieve full wet out, GF cannot warrant lifting of graphics.

UNSUITABLE USES

General Formulations does not warrant removability from the following surfaces:

- Graphics/Film applied to vehicles/surfaces over 5 years of age.
- Graphics/Film applied to non-OEM painted surfaces.
- Graphics/Film applied to non-cured OEM painted surfaces.
- Graphics/Film applied to textured or rough surfaces.
- Graphics/Film applied to oxidized painted or gel coated surfaces.
- Graphics/Film applied to stainless steel.
- Graphics/Film applied to surfaces to be submerged in water.
- Graphics/Film applied to surfaces with unknown existing graphics.

GF 800 series laminates are not warranted on competitors print films nor any substrate other than General Formulations print films.

TIPS & TRICKS FOR SUCCESSFUL APPLICATIONS

- Know your surface and its limitations (gaskets, rust, channels).
- Provide a controlled environment and a totally clean surface.
- Always use a sharp knife for trimming (snap-off or replace the blade frequently).
- Heated media applied to cold metal will cool quickly. Apply enough heat to do the job correctly and work in small areas.
- Seams and edges are common failure points. Cut all seams and then post heat and re-squeegee all edges for a good finished application.

COMMONLY ASKED QUESTIONS

Q: Can AutoMark™ be used on fiberglass boats?
A: Yes, if all Fluorinated waxes are completely removed.

Q: Can AutoMark™ be used on ceramic coatings?
A: No, the film will not stick to any ceramic coating.

Q: Can AutoMark™ be used for cut lettering?
A: Sign cutting of letters is not recommended for anything smaller than 2.5 inches. Must be tested for your specific use.

Q: Can a vehicle wrapped with AutoMark™ be taken through an automatic car wash?
A: No, GF does not recommend using automatic car washes. The brushes and equipment may scratch the vinyl, lift edges, reduce gloss, or cause failure points.

For more helpful informaton, please visit the individual product Technical Data Sheet (TDS) on www.generalformulations.com/technical-data-sheets.