

Introduction

ORAFOL Americas Inc., warrants its pressure-sensitive adhesive films to be free of defects in materials and manufacture, and to perform as stated in published product technical information bulletins if properly stored, processed and applied. **ORAFOL Americas** will, at its discretion for all **ORAFOL**® product lines that do not meet specified effective performance life, issue credit for the purchase price of the material through the authorized distributor from where the material was purchased.

The customer assumes responsibility in determining product suitability for intended use on any surface to which **ORAFOL**® materials will be applied. **ORAFOL Americas** shall not be liable for any direct, indirect, or consequential damages, arising from the use or inability to use the product. This warranty is declared in lieu of any other claim, whether expressed or implied, and is not subject to interpretation.

In no event will **ORAFOL Americas** be responsible for labor, consequential or incidental damages of any kind. Samples must be submitted to an **ORAFOL Americas**-approved laboratory to verify any claims against the stated material warranty. Surfaces to which ORAFOL materials are applied are not covered under this warranty. Direct replacement material will be authorized on a case-by-case basis only, and an individual failure shall not be construed as an indication of failure for the entire vinyl graphic package.

Application and removal of **ORAFOL**® films should be carried out exclusively by a qualified graphic application specialist.

Inappropriate or incorrect application or removal of **ORAFOL**® films or use of film types unsuited for the application may result in substrate surface damage or considerably reduced **ORAFOL**® film performance and/or service life.

Table of Contents

Service Life

| | |
|---------------------------------------|---|
| Climate Zone Durability | 3 |
| Climate Map View | 4 |
| Climate Zones Defined | 4 |
| Industrial Pollutants "Fallout" | 5 |

Helpful Application Tips and Warranty Guidelines

| | |
|---|------|
| Application Temperature | 6 |
| Wet Application | 6-7 |
| Glass Application | 7 |
| Stainless Steel Tanker Trailer Applications | 7 |
| Watercraft and Boat Applications | 8 |
| Adhesive Promoters | 8 |
| Unwarranted Metal Surfaces | 8 |
| Graphics Applied to Latex Painted Surfaces | 9 |
| Substrate Damage | 9 |
| Flexible Substrate Applications | 9-10 |
| Acrylic and Polycarbonate Applications | 10 |
| Product Compatibility and Performance | 10 |
| Laminating Printed Graphics | 10 |
| Solvent and Eco-solvent Ink Outgas Procedures | 10 |
| OEM Inks | 11 |

Service Life

The service life specified in the technical data sheets represents the maximum expected service life for vertical outdoor exposure under normal conditions identified as **Climate Zone 1** in the below Climate Zone diagram. The expected service life will be reduced for **Climate Zone 2 and 3** as shown in the tables below.

The following tables provide an overview of the expected reduction of maximum service life under deviating environmental conditions and orientations, divided into three climate zones. Applications with a deviation from the vertical level of more than +/-10° are considered horizontal applications. The mention of horizontal application is valid for all color films suitable for vertical and horizontal automotive applications (i.e., ORACAL® 970RA for full wrap or general automotive graphic application, ORACAL® 975, 951, 851, 751RA, 751, 651™ for general automotive graphic applications). In the case of all other films - not previously mentioned ORACAL®, ORAJET®, ORAGUARD®, ORALITE®, ORALUX® series films, the service life data apply only to vertical application uses.

For an overview of material combinations and expected maximum service life for vertical outdoor exposure under normal conditions and orientations, divided into three climate zones for printed/laminated ORAFOL® films, please review the (OCS) ORALIFE® Component System Warranty. ORAFOL Americas strongly encourages users to *register* and *qualify* for the (OCS) ORALIFE Component® System Warranty, [click here](#) for [details](#) and to [register](#).

Note

The service life data exclude in principle any gradual changes that may be caused by aging or weather conditions during the stated outdoor durability period. Examples are minor color fading, reduction of gloss and surface embrittlement without crack formation.

Expected Maximum Service Life in Years for Unprinted ORAFOL® Films

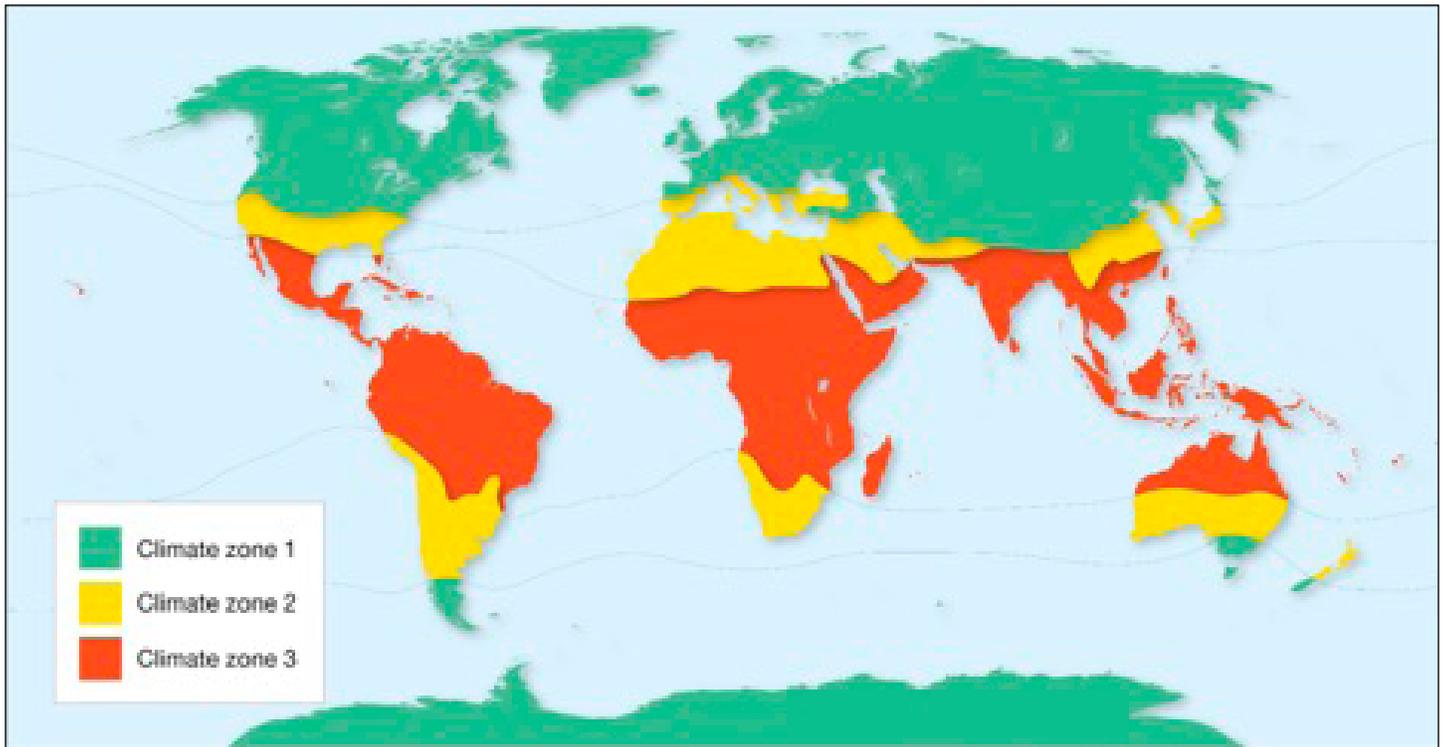
Vertical & Horizontal Exposure

| Climate Zone 1* <i>Mild Climate</i> | | Climate Zone 2* <i>Humid/Warm Climate</i> | | Climate Zone 3* <i>Dry/Hot Climate</i> | |
|--|------------|--|------------|---|------------|
| Vertical | Horizontal | Vertical | Horizontal | Vertical | Horizontal |
| Years | | Years | | Years | |
| 12 | 6 | 10 | 5 | 8 | 4 |
| 10 | 5 | 8 | 4 | 6 | 3 |
| 8 | 4 | 6 | 3 | 4 | 2 |
| 7 | 3.5 | 5 | 2.5 | 3 | 1.5 |
| 6 | 3 | 4 | 2 | 2 | 1 |
| 5 | 2.5 | 3 | 1.5 | 1.5 | 0.75 |
| 4 | 2 | 2 | 1 | 1 | 0.5 |
| 3 | 1.5 | 1 | 0.5 | 0.5 | 0.25 |

* Maximum expected service life in years

Note

The information on expected maximum service life does not justify claims under guarantees, warranties or for other reasons. The information is based on practical experience under artificial and natural weathering under standard conditions and is not strictly applicable to the calculation of expected maximum service life for all vehicles, since there are so many possible influences that may cause perceived reduction in film performance or cosmetic blemishes, such as mechanical damage from an automated car wash, chemical and caustic cleaning agents, environmental impacts - such as acidic dew ("Fallout"), bird droppings, insect splatter, snow removal chemicals - that dwell on the ORAFOL® film for too long.



Climate Zones Defined

The Americas and Caribbean

| Climate Zone 1 <i>Mild Climate</i> | | | Climate Zone 2 <i>Humid/Warm Climate</i> | | Climate Zone 3 <i>Dry/Hot Climate</i> | |
|--|---|---|--|---|--|-------------------------|
| Canada | | | | | | |
| United States | | | | | | |
| Alaska Washington Oregon <i>Northern</i> California Idaho Montana Wyoming <i>Northern</i> Utah Colorado North Dakota South Dakota Nebraska | Kansas Minnesota Iowa <i>Northern</i> Missouri Wisconsin Illinois Michigan Indiana Ohio <i>Northern</i> Kentucky Pennsylvania | <i>Northern</i> West Virginia Maryland Delaware New Jersey New York Vermont Massachusetts Connecticut New Hampshire Rhode Island Maine | <i>Central & Southern</i> California Nevada <i>Central & Southern</i> Utah Arizona New Mexico Oklahoma Texas <i>Central & Southern</i> Missouri Arkansas Louisiana | <i>Central & Southern</i> Kentucky Tennessee Mississippi Alabama Georgia <i>Southern</i> West Virginia Virginia North Carolina South Carolina <i>Northern & Central</i> Florida | Hawaii | <i>Southern</i> Florida |
| Mexico | | | | | | |
| All Central American countries All Caribbean countries & territories | | | | | | |
| South America | | | | | | |
| <i>Southern</i> Chile | <i>Southern</i> Argentina | <i>Central & Northern</i> Chile <i>Southern</i> Peru <i>Southern</i> Bolivia | Uruguay Argentina | Colombia Ecuador <i>Northern</i> Peru <i>Northern</i> Bolivia Paraguay | Venezuela Guyana Suriname French Guiana Brazil | |

Industrial Pollutants “Fallout”

Applications in some urban, valley or industrialized areas may experience reduced durability and/or cosmetic damage caused by atmospheric conditions such as acid rain, smog or other harsh pollutants. Damage from these pollutants is not covered by our product warranty.

For more information and helpful advice, please see the [“Dealing with Fallout” technical bulletin](#) located in the **Support** section of our [website](#).

Helpful Application Tips and Warranty Guidelines

The following helpful tips and guidelines are intended to provide basic knowledge about common application methods and general information for use of ORAFOL® products.

Application Temperature

ORAFOL® films should never be applied at temperatures below 46°F unless otherwise stated in the individual product technical data sheet. However, for best application results, surface and ambient temperatures should be between 65°-75°F; with humidity levels resting between 50 - 70%.

- Colder temperatures and lower humidity levels will result in the material feeling more rigid and the adhesive less tacky.
- Warmer temperatures and higher humidity levels will result in the material feeling more aggressive and pliable.

Newly applied graphics should remain in the application environment for at least 24 hours to promote uniform adhesion characteristics. A significant change in temperature should be avoided during the first 24 hours after the application is initially complete, as this may result in the material lifting or popping up in complex curved areas.

- For colder application temperatures between 50°F/10°C and 23°F/-5°C please consider our (DT) Deep Temperature films, ORAJET® 3161DT or ORAJET® 3551DT.

Wet Application

Wet applications are typically recommended for large surface applications of solvent-based adhesive products being applied to architectural glass and windows.

- For best results, ambient temperature should be at least 60°F.
- For wet applications, **ORAFOL Americas** recommends using a medium-tack application tape when applicable for plotter cut graphics.
- After the application fluid has ample time to dry, remove the application tape carefully at a 180° angle.
- Newly applied graphics should remain in the application environment for at least 24 hours to promote uniform adhesion characteristics and allow any residual moisture to evaporate.

Application Fluid Ingredients (*Recommended ingredients for wet application fluid*)

- One quart (32 fl oz.) of water.
- One tsp. of traditional Joy® or Dawn® dish detergent.
- 4-6 Tbs. of 70% Isopropyl Alcohol.
- Detergent should not contain moisturizers, lotions, or bleaching agents.
- Shake Well

Wet Application *(continued)*

Wet applications are **not recommended** or warranted for the following:

- ORAFOL® films utilizing ///
 - ORAMASK®, ORACAL® or ORAJET® films with polyacrylate dispersion (water-based) adhesive
 - all ORALITE® films
 - ORACAL®, ORAJET®, ORALITE® films with *RapidAir*® air-egress adhesive technology

Ammonia-based products or other glass and surface cleaners should **never** be used to clean a substrate or as an application fluid for vinyl installation. Wet applications should only be used on clean, smooth, and non-porous surfaces.

Glass Application

Glass and other surface cleaners may leave a residue that could cause poor adhesion between the graphic and the surface.

- Only clean glass with a mild detergent and water solution prior to vinyl application.
- The above mentioned Application Fluid works great as a general cleaning solution prior to application.
- If additional cleaning is needed, use only 70% Isopropyl Alcohol or ORAFOL® 359500030 Pre-Wrap Surface Cleaner to wipe down the surface. To learn more about ORAFOL® 359500030 Pre-Wrap Surface Cleaner, [click here](#).

Since glass is transparent, it is sometimes difficult to tell which side is contaminated when you are ready to clean. So it's important to clean both sides of the glass to ensure you are removing any possible contaminants or debris that could potentially cause poor adhesion of newly applied vinyl graphics.

ORAFOL Americas assumes no liability for glass breakage associated with application of its films on glass surfaces.

- For other tips to reduce the risk of poor adhesion properties and to reduce the risk of glass breakage, please contact [ORAFOL Americas Product Support Specialists](#) for suggested application guidelines.

Stainless Steel Tanker Trailer Applications

Due to the wide variety of stainless steel types, gauges, applications, and aggressive cleaning regiments, ORAFOL Americas does not warranty its products when applied to stainless steel tanker trailers

Watercraft and Boat Applications

ORAFOL Americas recommends the following print media and over-laminate combinations, solid-color change, striping and lettering material options for applications to well-conditioned boat and watercraft gelcoats:

- **Print Media Options**
 - ORAJET® 3951, 3951RA, 3751RA, 3551, or 3551RA
- **Over-Laminate Options**
 - ORAGUARD® 290, 290F, 293, 289F, 280, or 270
- **Solid-Color Change Wraps**
 - ORACAL® 970RA
- **Striping and Lettering Applications**
 - ORACAL® 951
 - ORACAL® 751 or 751RA
 - ORACAL® 383

Application on boats is generally **not recommended** below the water line.

No warranty is given for applications under water. Additionally, no warranty is given for graphic applications to severely weathered or oxidized surfaces such as gelcoat, painted, or aluminum watercraft surfaces.

Adhesive Promoters

ORAFOL Americas **does not promote or recommend** using any type of adhesive promoter or tape primer with its Graphic Innovations or Reflective Solutions products. Use of adhesive promoters or tape primers will void any applicable warranty coverage.

Unwarranted Metal Surfaces

Application and removal of ORACAL®, ORAJET®, ORAGUARD®, ORALITE® films applied to copper, tin, nickel, brass, lead, alloys, or magnesium will not be warranted. If a substrate is in question, please contact an [ORAFOL Product Support Specialist](#) prior to application.

Graphics Applied to Latex Painted Surfaces

Paint Formulation Changes

Over the past several years the paint industry has made significant changes to paint formulations in an effort to make less of an impact on our environment. Additionally, paint formulations are now more durable and have additives designed to repel dirt and moisture. Consequently, this shift has made it more challenging to achieve a successful graphic installation to these new paint formulations.

Pay special attention to paint coatings that are listed as having the following attributes:

Low-VOC, Zero-VOC, Hard-to-stick, "Stain-blocking", "Washable", or "Scrubable".

These types of paint coatings may present adhesion challenges between the wall graphic adhesive and the paint coating, and may require the use of an ORAFOL® material with solvent-based or high tack adhesive

Vinyl graphics must be applied to a clean, smooth, dry, and non-porous surface.

- Allow freshly applied latex paint to cure for (3) three full weeks prior to graphic application.
- Prior to application, test substrates by cleaning the surface with a dry lint free rag and apply a small test strip of the intended vinyl for 24 hours.
- If bubbles or edge peeling appear, out-gassing is still occurring.
- At this time it is best to let the paint continue to outgas and repeat the test in a few days or weeks.

Due to the wide variety of paint systems, substrate types, and finishes, substrate and paint damage due to graphic removal is not warranted.

For more information and helpful advice, please review the [Processing & Handling Interior Wall Graphic Applications document](#), or [FAQ's](#) located in the **Support** section of our **website**.

Substrate Damage

ORAFOL Americas is not responsible for the integrity of the substrate to which the vinyl graphic is being applied, and will not be liable for any direct or indirect damage to the substrate caused during graphic installation, expected service life, or graphic removal. It is up to the graphic installer and their customer to determine the suitability and integrity of the substrate to which the vinyl graphic is being applied.

Flexible Substrate Applications

For the general warranty to apply with selected ORACAL® plotter films, the following procedures must be followed:

- Prior to application, the selected flexible substrate should be thoroughly cleaned with a clean saturated rag containing a mild detergent and water solution and then dried.
- The surface should then be wiped down with Isopropyl Alcohol or ORAFOL® 359500030 [Pre-Wrap Surface Cleaner](#) using a clean rag to remove any surface contamination such as dust, grease, or other debris.

Flexible Substrate Applications *(continued)*

Application of a graphic marking film on a flexible substrate should be laid out on a rigid table top. After the initial application, graphics should then be burnished using a rivet brush. Multiple cycles of applying heat and pressure will help ensure a solid bond between the adhesive and the subtle texture of the substrate. (Always apply vinyl graphics to the smoother side of flexible substrates.) Graphics applied to previously used flexible substrates will not be warranted. **ORAFOL Americas** does not recommend applying printed and laminated graphics to flexible substrates.

Acrylic and Polycarbonate Applications

When using substrates that tend to outgas, such as polycarbonate or acrylic products, it is recommended to remove the protective liner on these substrates to allow proper outgas time prior to installation.

- Either treat the substrate with a heat source or store it for 24-36 hours at room temperature conditions in order to cure the substrate prior to application of the vinyl graphic.
- Be sure to properly test these substrates by cleaning the surface and applying a small test strip for 24 hours.
- If bubbles or edge peeling appear, outgassing is still occurring.

Product Compatibility and Performance

Please contact **ORAFOL Americas** [Product Support Specialist](#) to ensure proper product combinations, and substrate compatibility for your specific job. No warranty will apply when combining ORACAL®, ORAJET®, ORAGUARD®, and ORALITE®, branded films with films produced by any other manufacturer.

- For a list of compatible ORAJET® and ORAGUARD® combinations, along with application recommendations, please review the **ORAFOL Graphic Innovations** [Digital Inkjet Media Selection Guide](#).

Laminating Printed Graphics

Lamination of inkjet prints is recommended to ensure longer lifespan at optimum quality (gloss, color, physical damage). ORAGUARD® laminate films enhance the desired appearance of the graphic (gloss, semi-gloss, matte). They also provide excellent protection against ink fading from exposure to UV rays.

Solvent and Eco-Solvent Ink Outgas Procedures

When using ICC Color Profiles downloaded from www.orafol.com, **ORAFOL Americas** recommends allowing printed films at least 24 hours at 70°F to dry (outgas) before applying a laminate to avoid delaminating or adhesive failure (48-72 hours preferred). Note the following considerations:

- 24 hours of dry (outgas) time should be considered the minimum before applying lamination. (Prints with very little ink coverage would fall into this category.)
- If the print is heavy in ink saturation, (darker, rather than lighter) a longer outgas time of 48-72 hours is preferred for the print to dry before lamination.
- Using third-party inks and generic color profiles may result in poor printing quality, and require more time to effectively dry (outgas).

DO NOT leave the graphic rolled up tightly around the core after printing. This will cause the solvent gasses in the inks to be trapped and potentially migrate to the adhesive layer of the material, resulting in poor adhesion properties once applied to the intended substrate.

OEM Inks

ORAFOL Americas only warrants the compatibility of OEM solvent, eco-solvent, latex, and UV curable ink-sets with its approved inkjet printable materials. Each series of ORAJET® digital media requires different print and RIP software parameters because of the individual qualities of each material. Check the **Support section** of our **website** for a wide selection of [FREE color profiles](#).

For questions regarding the guidelines in this document please contact a [Product Support Specialist](#).

Note

Surfaces to which the material will be applied must be thoroughly cleaned from dust, grease or any contamination which could affect the adhesion of the material. Freshly lacquered or painted surfaces should be completely cured. The compatibility of selected lacquers and paints should be tested by the user, prior to application of the material. Films with structured surface are naturally more sensitive than the unstructured. Accordingly, these films are to be treated carefully both in processing and in cleaning. Impurities affect the appearance of structured films and require more frequent cleaning. Furthermore the application information published by ORAFOL is to be considered. The batch traceability according to ISO 9001 is possible on the basis of the roll number.

IMPORTANT NOTICE

All ORAJET® products are subject to careful quality control throughout the manufacturing process and are warranted to be of merchantable quality and free from manufacturing defects. Published information concerning ORAJET® products is based upon research which the Company believes to be reliable although such information does not constitute a warranty. Because of the variety of uses of ORAJET® products and the continuing development of new applications, the purchaser should carefully consider the suitability and performance of the product for each intended use, and the purchaser shall assume all risks regarding such use.

All specifications are subject to change without prior notice.



ORAFOL Americas - GA

1100 Oracal Parkway
Black Creek, GA 31308

912-851-5000 • Fax | 912-851-5110
Toll Free | 888-672-2251

ORAFOL Americas - CT

120 Darling Drive
Avon, CT 06001

860-676-7100 • Fax | 860-676-7199
Toll Free | 800-654-7570

ORAFOL Canada

2831 Bristol Circle
Oakville, Ontario L6H 6X5

905-829-2828 • Fax | 905-829-9941
Toll Free | 888-727-3374