

Product Description

- For UV and latex inkjet printing
- 2-mil, white non-PVC film made from 40% bio-based materials*

* Derived from non-food source corn.

Product Features

- Pressure-activated adhesive for easy sliding, tacking, snap-up, and repositioning
- Air release channels for fast, easy, bubble-free installations
- Ultra-removable adhesive, removable from existing films** without heat and/or chemicals
- Expected performance life of five years (unwarranted period for unprinted film with no graphic protection, applied to a flat, vertical, outdoor surface)

** Please refer to the Instruction Bulletin for further details on ultra-removability requirements.

Recommended Types of Graphics and End Uses

- Indoor and outdoor signs, emblems, or striping
- Vehicle and fleet graphics, emblems, or striping
- Vending or dispensing machine and cooler graphics

When constructed and used as described in this bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Read this entire bulletin for details.

Recommended Compatible Products

Graphic Protection

- [3M™ Scotchcal™ Gloss Overlamine 8518](#)
- [3M™ Scotchcal™ Luster Overlamine 8519](#)
- [3M™ Scotchcal™ Matte Overlamine 8520](#)
- [3M™ Envision™ Gloss Wrap Overlamine 8548G](#)
- [3M™ Envision™ Luster Wrap Overlamine 8549L](#)
- [3M™ Envision™ Matte Wrap Overlamine 8550M](#)

Typical Physical Properties

NOTE: The following technical information and data is based upon limited 3M testing conditions and should not be used for specification purposes.

Physical Characteristics

Characteristic	Value
Material	Non-PVC film made from 40% bio-based materials*
Film Color	White, opaque
Thickness	Without adhesive: 0.05 mm (2 mil) With adhesive: 0.08 – 0.10 mm (3 – 4 mil)
Adhesive	Pressure-activated (slide, tack, snap-up, reposition) with air release channels
Adhesive Color	Grey
Liner	Polyethylene-coated paper
Typical Adhesion 24 Hours After Application	HDPE: 0.9 – 2.6 N/cm (0.5 – 1.5 lbf/in.) Fruehauf pre-painted panels: 1.8 – 3.5 N/cm (1 – 2 lbf/in.) Alodine aluminum: 5.3 – 7.0 N/cm (3 – 4 lbf/in.) Stainless steel: 1.8 – 3.5 N/cm (1 – 2 lbf/in.)
Tensile Strength	1.34 kg/cm at 23°C (7.5 lbs/in. at 73°F)
Chemical Resistance	Excellent resistance to water (does not include immersion)
Flammability	Flammability standards are different from country to country. Ask your local 3M contact for details, please.

* Derived from non-food source corn

Application Characteristics

Characteristic	Value
Finished Graphic Application Recommendation	Surface type: Flat, with and without rivets, simple curves, moderate compound curves Substrate type: Painted metal Application method: Dry Application temperature (air and substrate): Flat surfaces with and without rivets: 4°C to 32°C (40°F to 90°F)
Applied Shrinkage	< 0.8 mm (0.032 in.)
Temperature Range After Application	-40°C to 107°C (-40°F to 225°F) (Though not for extended periods of time at the extremes.)
Graphic Removal	Removable without heat or chemicals from most surfaces at temperatures greater than 10°C (50°F), air and substrate. PL50mC has an ultra-removable adhesive. The film adheres to and removes from existing films. Please refer to the Instruction Bulletin for further details on ultra-removability requirements.

Factors Affecting Graphic Performance Life

The actual performance of a graphic is affected by:

- Complete ink drying or curing
- The combination of graphic materials used
- Selection, condition, and preparation of the substrate
- Surface texture
- Application methods
- Environmental conditions
- Angle and direction of sun exposure
- Cleaning and maintenance methods
- Removal methods and conditions

Graphics Manufacturing

CAUTION

Before using any equipment, always read the manufacturer's instructions for safe operation.

Inkjet Printing

Always read and follow the ink manufacturer's written instructions on usage.

Total Ink Coverage

The maximum recommended total ink coverage for this film is:

- 280% when printed entirely with approved 3M UV inkjet inks.
- 280% when printed entirely with approved 3M latex inkjet inks.

Do NOT exceed the recommended total ink coverage for this product. Having too much total physical ink on the product results in media characteristic changes, incomplete drying, overlamine lifting, and/or poor graphic performance. For additional details about total ink coverage, refer to the 3M product and instruction bulletins for 3M inks or the [3M Performance Guarantee Matrix](#) for OEM inks.

Completely Dry Graphics

IMPORTANT NOTE

Incomplete drying or curing can result in graphic failure including curling, increased shrinkage, and adhesion failure, which are not covered under any 3M Graphics warranty.

See the ink's 3M product and instruction bulletins for more details.

Cutting

See [3M Instruction Bulletin 4.1](#) for Sheeting, Scoring and Film Cutting details.

Graphic Protection

Graphic protection may improve the appearance, performance, and durability of the graphic. Click on the graphic protection options listed in this product bulletin or see the [3M Graphics Materials Product Catalog](#) for more information.

IMPORTANT NOTE

During installation, scratches may occur on films without graphic protection.

Application Tapes

There are two types of application tapes. See [3M Instruction Bulletin AT-1](#) to determine what application tape is recommended for your 3M Graphics Products. Finished graphics eligible for any 3M warranty must be constructed using approved 3M Graphics Products. See the [3M Graphics Warranty Bulletin](#) for more details.

Premasking Tape

Premasking tape increases stiffness during application while preventing stretching and damage. Use when little or no liner is exposed. See [3M Product Bulletin 4.3](#) for complete details.

Prespacing Tape

Prespacing tape holds cut and weeded letters or graphics in place during application and after removal of the film liner, while preventing stretching and damage. Use when large amounts of liner are exposed. See [3M Product Bulletin 4.3](#) for complete details.

Application and Installation

In addition to other 3M bulletins specified in this document, the following bulletins provide details users may need to successfully apply a graphic.

- [3M Instruction Bulletin 5.36](#) Application Techniques for Automobiles, Vans and Buses
 - Complete the 3M Pre-Installation Inspection Record found in 5.36 prior to manufacturing or applying a graphic to an automobile, van, or bus.
- [3M Instruction Bulletin 5.4](#) Application, Fleet Trucks
- [3M Instruction Bulletin 5.5](#) Application, General Procedures for Interior and Exterior Dry Application
- [3M Instruction Bulletin 6.5](#) Storage, Handling, Maintenance, and Removal of Films and Sheetings

IMPORTANT NOTE

UV inkjet inks may crack if too much heat is used during graphic application to complex curves and deep contours as well as around rivets. When using heat during application, make sure the film surface temperature does not exceed 100°C (212°F). For best results, **always do a test application** of a printed graphic to determine how much heat can be used without damaging the image.

Pressure-activated Adhesive

The pressure activated adhesive on this film offers:

- smooth sliding into position on a substrate;
- fast finger tacking to check positioning; and
- easy snap-up and repositioning when you need it.

The snap-up and reposition feature is lost:

- when firm pressure with a squeegee or other application tool is applied;
- at application temperatures above 38°C (100°F) even if only light finger pressure was used for tacking;
- if any part of the film is removed from the original liner and reapplied to the same or another liner; or
- if solvent from inkjet ink has not completely dried or cured, affecting both slideability and snap-up.

Working with Air Release Channels

Air release channels are a characteristic of films with Comply™ adhesive that allow trapped air to exit through the edges of the graphic.

- The channels will be damaged and effective air removal affected if you remove and attempt to change liners or reapply the same liner.

For the best results, always work from the center out to the edges of the graphic to allow trapped air to exit through the air release channels. If the channels are closed off by firm pressure and air is trapped, use an air release tool to help remove air bubbles. See [3M Instruction Bulletin 5.4](#) for details.

Maintenance and Cleaning

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline). See [3M Instruction Bulletin 6.5](#) for details.

Removal

This film can be easily removed within the specified warranty period without heat or chemicals. Most graphics can be removed and leave little or no adhesive residue on the substrate. The ease and rate of removal depend on a number of factors. See [3M Instruction Bulletin 6.5](#) for details.

Shelf Life, Storage, and Shipping

Shelf Life

The shelf life is **never more than two years** from the date of manufacture on the original box. Processing the film changes its shelf life to **one year** from the processing date, but no later than two years from the manufacturing date.

Storage Conditions

- 4°C to 38°C (40°F to 100°F)
- Out of sunlight
- Clean, dry area
- Original container
- Bring the film to room temperature before use

Shipping Finished Graphics

Flat, or rolled printed side out on a 6 in. (15 cm) or larger core. This helps prevent the liner, if used, from popping off.

Health and Safety

Tools and Equipment Usage

When using any equipment, always follow the manufacturer's instructions for safe operation.

Chemicals

When handling any chemical products, read the manufacturers' container labels and the Safety Data Sheets (SDS) for important health, safety, and environmental information.

[Follow the link to obtain SDS sheets for 3M products on 3M.com/SDS.](https://www.3m.com/SDS)

[Follow the link to obtain information about substances of very high concern \(SVHC\).](#)

Warranty Information

Technical Information

Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

Product Selection and Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer

Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

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