

## Commercial Solutions Division

- 3M™ Print Wrap Film IJ280
- 3M™ Envision™ Print Wrap Film LX480mC
- 3M™ Envision™ Print Wrap Film SV480mC
- 3M™ Print Wrap Film IJ180Cv3-10
- 3M™ Print Wrap Film IJ180mC-10
- 3M™ Print Wrap Film IJ180mC-114
- 3M™ Print Wrap Film IJ180mC-120
- 3M™ Print Wrap Film IJ180mC-10LSE
- 3M™ Print Wrap Film IJ180mC-10SLS
- 3M™ Wrap Film 2080

## General Information

This Bulletin is specifically for the application of 3M™ Print Wrap Film IJ280, 3M™ Envision™ Print Wrap Film LX480mC, 3M™ Envision™ Print Wrap Film SV480mC, 3M™ Print Wrap Film IJ180Cv3-10, 3M™ Print Wrap Film IJ180mC-10, 3M™ Print Wrap Film IJ180mC-114, 3M™ Print Wrap Film IJ180mC-120, 3M™ Print Wrap Film IJ180mC-10LSE, 3M™ Print Wrap Film IJ180mC-10SLS and 3M™ Wrap Film 2080 used for substrates with recesses.

### Important Notice

3M™ Wrap Film is not intended for wet applications. Residual water will cause lifting in the recesses after application.

All 3M™ Wrap Film 2080 gloss have a clear protective film layer to prevent scratching; this protective film layer must be removed after installation.

Some products mentioned in this document might be available only in certain regions.

## Selecting the Appropriate Print Film

Different type of recesses and application technique are causing different stress to the graphic. The table below lists typical kind of challenging recesses and recommended 3M products to use.

The tables below assume the application without making relief cuts or using adhesion promoters.

Making relief cuts enable the non- stretched, stress free graphic to adhere in the recess.

The usage of adhesion promoters can aid to increase the performance of film in recesses and reduce the risk of film lifting. Please consider the impact of reduced removability when using adhesion promoters.

## Stretching Capabilities of Wrap Film Graphic Constructions

### Application Methods

<b>A</b>	Follow Contour of the substrate - no heating
<b>B</b>	Heat stretch - minimum of 20 cm (8") away from recess
<b>C</b>	Bridge the area, heat and stretch

## Graphics Protection & Inks

<b>Best</b>	3M™ Gloss Wrap Overlamine 8428G, 3M™ Envision™ Gloss Wrap Overlamine 8548G, 3M™ Envision™ Luster Wrap Overlamine 8549L, 3M™ Envision™ Matte Wrap Overlamine 8550M, most Solvent Inkjet Inks, Latex Inks, GSLXr SuperFlex Ink
<b>Good</b>	3M™ Scotchcal™ Gloss Overlamine 8518, 3M™ Scotchcal™ Luster Overlamine 8519, 3M™ Scotchcal™ Matte Overlamine 8520, 3M™ Scotchcal™ Gloss Overlamine 8528, 3M™ Scotchcal™ Ultra-Matte Overlamine 8915, 3M™ Wrap Overlamine Series 8900, 3M™ Screen Print Dirt Resistant Gloss Clear 1920DR, 3M™ Screen Print UV Gloss Clear 9740i, 3M™ Screen Print UV Gloss Clear 9760LX, most UV Inkjet Inks




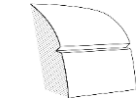
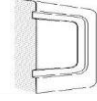

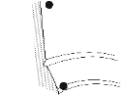
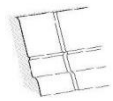
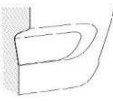
## Important Notice

To achieve stretching capability with 9740i or 9760LX, you have to follow optimal processing conditions. For detailed information, please refer to the respective product bulletin.

If 3M™ Wrap Film 2080 is printed with or without graphic protection the wrap shop assumes all risk for testing, approving, suitability and warranty.

Follow preparation, application and post-heating techniques.

Film inlays and adhesive promoter – not required, but add extra level of insurance against lifting and may be needed for very deep recesses.

Surface Description	Example	Application Method	IJ180mC	IJ280/ LX480mC/ SV480mC	2080	Inks & Protection
Single Recess Channel		B	✓	✓	✓	Good
						Best
Wide Corrugations (i.e. Van Roof)		C	✓	✓	✓	Good
						Best
Multi Dimensional Concave (i.e. Door Handle)		C	✓	✓	✓	Good
						Best
Small V-Shape Channel		A	✓	✓	✓	Good
						Best
U-Shape Recess		C	-	✓	✓	Best
Single Recess With Additional Adjacent		B	-	✓	✓	Best
Combined Recesses (i.e. Front Wheel Well)		B	-	✓	✓	Best
Micro-V Channel		Requires inlays	✓	✓	✓	Good
						Best
License Plate Holder		Requires inlays	✓	✓	✓	Good
						Best

Please contact 3M in case your kind of recess is not listed in the above table.

## Surface Preparation

All substrates must be considered contaminated. Clean the substrate immediately before applying the film. Dust and other contaminants can collect quickly on the substrate and prevent the film from adhering properly.

1. Use a solution of 1 ounce of liquid dish washing detergent per gallon of lukewarm water to thoroughly clean the vehicle. Rinse with water.

Avoid soaps or preparations that contain waxes, oils or lotions; some window cleaners contain waxes! Be aware that the chemicals used in some automated vehicle washing equipment may prevent good film adhesion.

Pay particular attention to cleaning the front and rear of the vehicle and areas where the film will be wrapped around, like doors and body seams.

2. Dry the surface thoroughly with clean, lint-free paper towels. A heat gun may be used to apply moderate heat and accelerate the drying.

Moisture prevents the adhesive from adhering correctly, can cause bubbles, and can freeze in cold environments. Any moisture trapped beneath the graphic will cause the graphic to fail prematurely.

Inadequate drying after cleaning as well as from application solutions.

Condensation can occur at low installation temperatures (below 15°C or 60°F), so having a dry surface is critically important.

3. Wipe the surface again with a solvent-based cleaner. Refer to the list of cleaners, below. Be sure that the cleaner does not damage the vehicle's paint.

**Note:** Car wax can greatly reduce graphic adhesion. Solvent-based cleaners must be used to thoroughly remove any wax residue. Saturate a clean paper towel with the cleaner.

With the saturated towel, wipe the surface where the graphic will be installed 12" (30 cm) beyond this area.

Before the cleaner evaporates from the substrate, wipe the surface with a dry, lint-free paper towel. As the paper towel becomes dirty, discard it. A dirty towel will simply move the dirt around, rather than remove it.

4. In order to further improve the adhesive performance, 3M recommends to repeat Step 3 using isopropyl alcohol (IPA) as the cleaner.

If using industrial grade IPA, mix a solution of 2 parts IPA to 1 part water. If using 70% rubbing alcohol, do not dilute it.

**Note:** IPA evaporates very quickly. Always wipe the surface before it evaporates. The evaporation rate increases in warm and/or windy environments.

## Solvent-based Cleaning Products

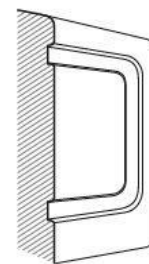
This list of solvent-based cleaners is provided for your convenience; other acceptable cleaners may be available. 3M does not endorse any particular chemical manufacturer or supplier.

- Sherwin Williams R7K156 Sher-Will-Clean®
- Sherwin Williams R7K158 Sher-Will-Clean®
- PPG DX/SX330 Cleaner
- DuPont™ Prep-Sol® Cleaning Solvent 3919S™
- SPS – 3M™ Surface Preparation System



## Application

This instruction bulletin shows how to apply graphics into the following two types of recesses.



Single Recess using application method "B": Heat stretch - minimum of 20 cm (8") away from recess.

U-Shape Recess using application method "C": Bridge area, heat and stretch.

## Premasking and Prespacing Tapes

The use of Application Tape is not required on laminated graphics and 3M™ Wrap Film 2080. However, depending on environmental conditions (high temperature) it may be an advantage for a trouble free application. The use of Application Tape is recommended for clear coated samples.

For large format graphics 3M™ Premasking Tape SCPM-19 and 3M™ Premasking Tape SCPM-44X can be used. 3M™ Prespacing Tape SCPS-100 or 3M™ Prespacing Tape SCPS-55 is suitable for pre-spaced graphics or logos.

## Adhesion Promoters

The usage of adhesion promoters within the recess area will increase the adhesion of the graphic. It is considered an extra level of insurance to avoid film lifting.

Repositionability and removability will be lost in areas where adhesion promoters are used.

3M offers two options to promote good adhesion to the vehicle body: 3M™ Primer 94 and 3M™ Adhesion Promoter 111.

### 3M™ Primer 94

If you choose to use 3M Primer 94 or other adhesion promoters, apply it to:

- The deepest part of any channel
- Both sides of any silicone bead

Apply film within 5 minutes to 60 minutes after Primer 94 application.



Break the glass inside the primer 94 ampules to activate. Apply primer 94 to the deepest part of the channel.

## 3M™ Adhesion Promoter 111

Using 3M™ Adhesion Promoter 111 is another option for promoting adhesion to vehicle substrate.

### Important Note

3M™ Adhesion Promoter 111 should only be applied to recessed areas, edges, and areas of high stress, due to its ability to promote adhesion. Promoter 111 may leave adhesive behind during removal.

### Important Note

Be sure to clean beyond areas where the film will be wrapped, such as the backside of the doors, all painted surfaces and behind rubber moldings.



Wet 3M™ Adhesion Promoter 111 on a lint free cloth and wipe the cloth in the recessed areas and edges.

## Health and Safety

When handling any chemical products, read the manufacturers' container labels and the Safety Data Sheets (SDS) for important health, safety and environmental information. To obtain SDS sheets for 3M products go to [3M.com/SDS](http://3M.com/SDS), or by mail or in case of an emergency with any equipment, call your local Technical Service and always follow the manufacturers' instructions for safe operation.

State Volatile Organic Compound (VOC) regulations may prohibit the use of certain chemicals with VOC's in graphic arts coatings and printing operations. Check with you local environmental authorities to determine whether use of this solution may be restricted or prohibited.

## Pre-application Instruction

This Instruction Bulletin provides detailed procedures and tips for a successful, durable graphic application. Failure to follow these procedures may result in graphics with wrinkles and/or lifting from contoured areas.

- Maintain the vehicle and ambient temperatures between +16°C (60°F) and +32°C (90°F).
- Ensure the application environment is clean and well lit.
- Sweep the work area clean to remove any loose dirt or particles.
- Use a clean table top for handling the graphics. Do not place the graphics on the floor.
- If washed in an automatic car wash, do not select "spot-free rinse" option.
- Ensure the vehicle surface is completely dry.

## Application Tools

Beside manual application, specially developed hand-rollers can be used for the application of the film into recessed areas. The hand-rollers (3M™ Roller S and L) allow the film to be applied with uniform, continuous pressure and low friction.



(3M™ Roller S and L)

When applying manually, wear textile gloves to lower the friction between finger and film.

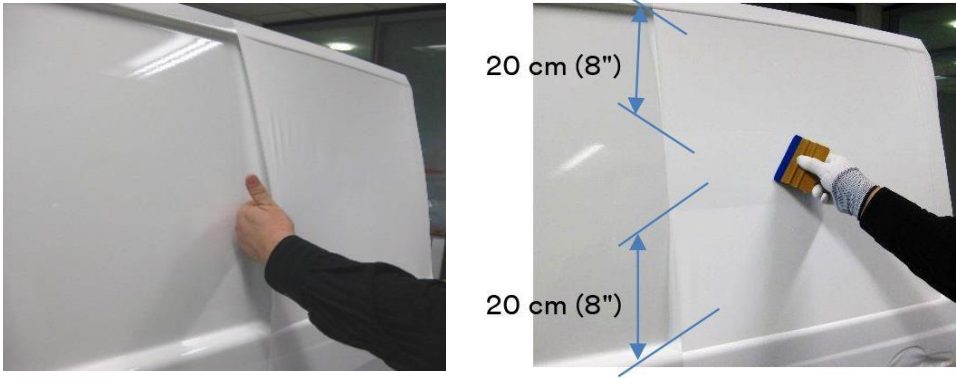
## Application to Single Recess (Method B)



Position the film and apply it from the top and fix the edges of the contours.



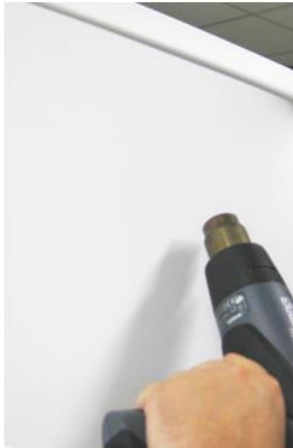
In case of applying the graphic within the recess area, do not apply closer than 20 cm (8") to the recess. To minimize the risk of lifting, it is essential, to have sufficient amount of material left. Use firm, even application pressure. The use of 3M™ PA-1 Gold Squeegee with thin and soft sleeve (e.g. microfibre) is recommended. Wetting of sleeves helps to avoid scratches on film surface during application.



Heat the film around the recess area with a professional heat-gun to the following temperature based on the base film (see table).

Base Film	Film Temperature during Installation		Film Temperature Post-heating	
	°C min.	°C max.	°C min.	°C max.
280	40	50	95	110
180	45	55	95	110
2080	40	50	80	95
480	50	60	110	120

Applying heat to areas of film 20 cm (8") beyond the recess area will reduce the tension of the film when being applied in the recess area.

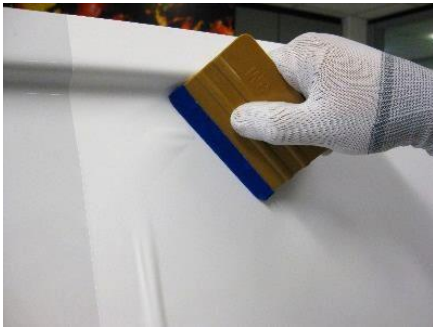


Apply the film into the recess either with your finger or with the hand roller (3M™ Roller L or S).



After the film is completely applied into the recess, apply the film on the remaining area within the recess.

Due to the 3M™ Comply™ technology, trapped air can easily be removed without causing air bubbles.



## Application to U-Shape Recess

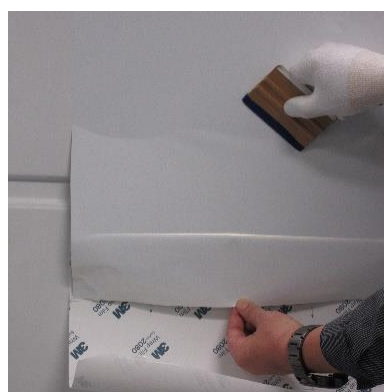
### (Method C)

When planning the film application in the recess area, make sure you leave a path for the air to escape.

- Position the film panel onto the substrate and fix the film panel with magnets or masking tape on the top.
- Roll the film panel up to the top. Remove the liner carefully from the film.
- Start the application on the flat part of the substrate and bridge the film over the recess (deep channel).



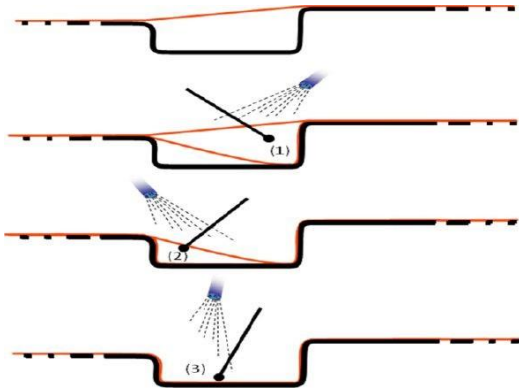
Films require high squeegee pressure to avoid air entrapment between film and substrate. Therefore the use of 3M™ PA-1 Gold Squeegee with thin and soft sleeve (e.g. microfibre) is recommended. Wetting of sleeves helps to avoid scratches on film surface during application.



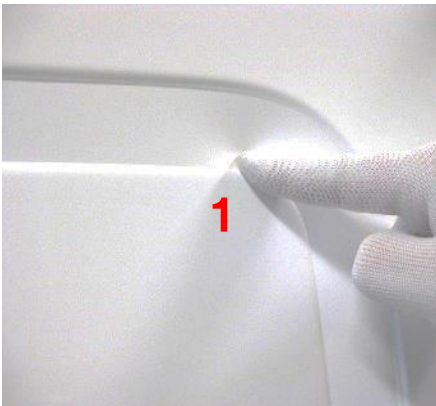
Apply the film into the recess either with your thumb, your finger or with the hand roller (3M™ Roller L or S).



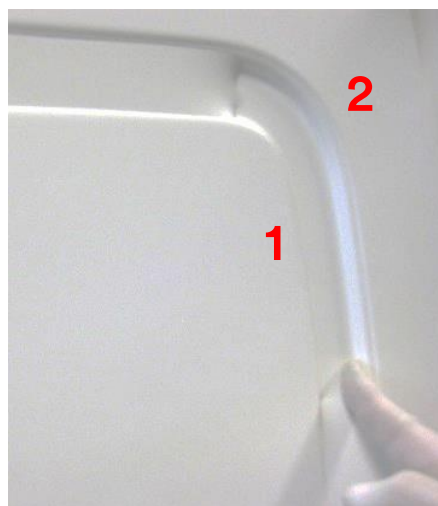
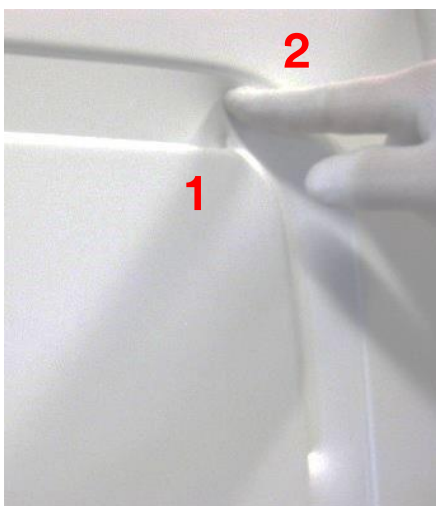
When applying manually, wear textile gloves to lower the friction between finger and film. Heat the film around the recess area with a professional heat-gun. Temperature table see page 7. Start film application in the recess in the deepest point first (1). Then continue at the opposite point of the recess (2). Last apply the film in the middle part of the recess (3).



(1) Deepest point first:



(2) Opposite side:



(3) Center:



## Post-Heating of Film Applied to Single Recesses and U-Shape Recesses

For application on recesses, post-heating is required. Ensure that no air bubbles are left trapped between the substrate and the film by re-heating the film in the recessed areas and deep channels with a hot-air gun. By doing this, overlooked air bubbles can be detected. Air bubbles between the film and the substrate must be removed with the air release tool.



After checking air bubbles, the film should be heated. Temperature table see page 7. Re-roll immediately the film with the small hand-roller in the recessed areas and deep channels. This softens the adhesive, closes remaining air channels and ensures good final adhesion.

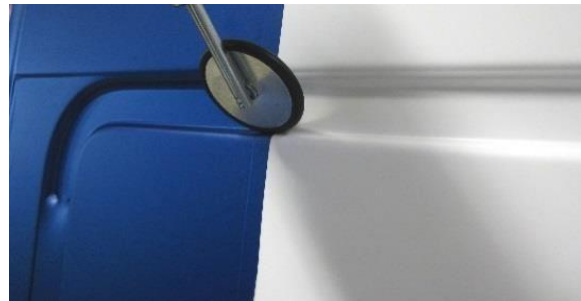
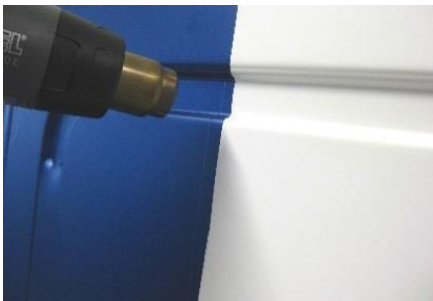


The hand-rollers (3M™ Roller S and L) allow the film to be applied with uniform, continuous pressure and low friction.

**Important:** All 3M™ Wrap Film 2080 gloss have a clear protective film layer to prevent scratching; this protective film layer must be removed before post heating.

### Post-Heating of Overlaps

**Important:** In order to avoid lifting at the overlaps of the panels, post-heating of the overlaps with the hot-air gun of at least +100°C (210°F) to 120°C (250°F) is necessary to avoid lifting failures.



**CAUTION:** Re-heating of the film and repressing the film into the recesses and deep channels is a quality control to assure a proper application without air bubbles.

Omitting this can lead to lifting failures!

**Important:** All 3M™ Wrap Film 2080 gloss have a clear protective film layer to prevent scratching; this protective film layer must be removed before overlapping and post-heating of overlaps.

### Finishing the Installation

To finish the installation re-heat all edges to check film stays free of tension at +40°C (100°F) to +60°C (140°F). Maintain the vehicle at an ambient temperature above +16°C (60°F) for at least 12 hours, but longer if possible, before exposing it to either a cold or wet climate. This allows the film's adhesive bond to build and strengthen. The vehicle may be washed by hand or in a touchless automated car wash after more than 24 hours using normal vehicle washing solutions. Dry the graphics to prevent hard water stains. Do not use high pressure spray directed at the edges of the film, which can degrade and lift the edges of the film.

For fast heating of larger film areas the use of Infrared heater (2000 W, e.g. TERM 2000 CVH from company Burda Worldwide Technologies GmbH) is another option.

**Important:** All 3M™ Wrap Film 2080 gloss have a clear protective film layer to prevent scratching; this protective film layer must be removed before re-heating all edges.

## Limited Remedy

### Unsuitable End Uses

3M recommended product end uses are listed in each 3M graphics product bulletin. End uses not listed in the applicable 3M Graphics Product Bulletins are typically not eligible for 3M Graphics Warranties. For non-recommended and/or non-warranted end uses or applications, users must test and approve the end uses or applications, assume any associated risks, and acknowledge that 3M has no liability for such end uses or applications. Please contact your 3M representative with any questions about graphic applications, end uses, and warranties.

### Limitations of Liability

All questions of warranty and liability relating to this product are governed by the terms and conditions of the sale, subject, where applicable, to the prevailing law.

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