



# Application of 3M Pressure Sensitive Films to 3M™ Panagraphics™ Substrates

## Preparation

### Points to Consider Before Applying the Film

- Constant rubbing against the film by retainers or other parts of the sign body may tear the film, which may result in light leaks.
- Translucent film may be applied to the substrate before or after the substrate is installed and tensioned in a sign cabinet.
- Use only the films recommended in the Product Bulletin for the 3M™ Panagraphics™ Substrate you are using.
- For small (narrow stroke width, nominal 0.5 inch) spaced legends or logos, a dry film application is normally used.
- Do not use more than two layers of film.
- Do not overspray paint onto a film applied to Panagraphics substrate.
- When the film extends to the outside edge of the substrate, we recommend applying the graphic to an installed and tensioned substrate. This prevents a scalloped appearance where the sign face clamps are installed. Scalloping is normally visible only with lines running in the same direction as the edge of the sign and within about one foot of the visible opening.
- If possible, do not expose a fabricated sign face to direct sunlight for at least 24 hours. This allows any trapped detergent and water to dissipate.

## Tools and Equipment

- 3M™ Plastic Applicator PA-1 (blue or gold squeegee)\*  
*Be sure it is smooth and free of nicks.*
- 3M™ Low Friction Sleeve SA-1\*
- Pin or 3M™ Air Release Tool 391X\*
- Sharp knife or razor blade in a safety holder
- Mild liquid detergent; do not use soaps or detergents containing enzymes
- Isopropyl alcohol
- Clean, lint-free clothes

\*Available from 3M Commercial Graphics Division.

## Surface Preparation

All surfaces must be considered contaminated and MUST be cleaned prior to application of film. Refer to Instruction Bulletin 5.1 for more details.

1. Wash the substrate with mild liquid detergent and water, then rinse with clean water.
2. Wipe dry with a clean, lint-free cloth.
3. Saturate a clean, lint-free paper towel with isopropyl alcohol (IPA) and wipe a small area—about 2 to 3 square feet (60 to 90 cm<sup>2</sup>). Do NOT allow the solvent to evaporate; dry the area with another clean, lint-free paper towel immediately.

## Film Applied Over Another Film

Note: This section does not apply to overlaps.

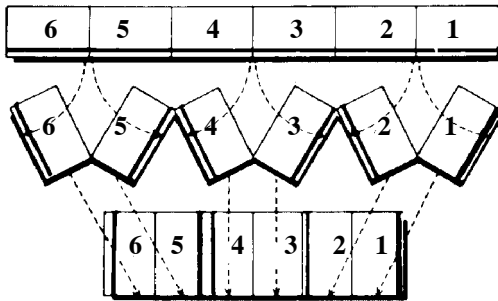
Translucent film may be applied over other recently applied translucent film using the application techniques described in this Bulletin.

## Panel Matching for Translucent Films Only

Whenever two or more pieces of the same color translucent film are seamed together as a continuous band of color, they should be matched to assure uniform daytime color and transmitted nighttime appearance.

Material from a single roll or lot must be used on a single marking or sign for identical color matching.

In general, translucent film from a roll can be matched as shown in Figure 1. The dark line represents one edge of the film.



**Figure 1. Roll Matching**

Notice that the matching edges are rotated to meet each other. Panels 1 and 2 are a matched set. Pieces 1, 2 and 3 are matched, etc. By following this method you can match as many sheets from a roll as are required for any size sign.

## Premasking and Prespacing

- Generally, film applied using the detergent and water method does not need to be premasked. If it is needed, you can use 3M™ Premasking Tape SCPM-3.
- Graphics with multiple letters or symbols, or with intricate shapes, should be prespaced with 3M™ Prespacing Tape SCPS-2.

## Registry Marks

As an aid for aligning and registering graphics on surfaces prior to application, registry marks may be made on the top or side edge with a lead pencil, marking pen, or small pieces of masking tape. Registry marks may also be included in computer-cut graphics.

Note: Do not use a chalk line.

## Cutting and Weeding

Note: Cutting and weeding graphics should be done prior to application to prevent possible damage to the substrate. If cutting is done after application, exercise caution to prevent the cutting of the substrate.

## Cutting

1. Patterns may be pounced onto the applied films using chalk or carbon dust. (Some carbon papers and some marking pens may permanently mark the film, so check their suitability before using.)
2. Cutting may be done with a conventional fixed or swivel graphic knife.
3. Avoid or minimize over-cuts to eliminate or reduce light leaks.
4. The adhesion of the film to the substrate builds with time. It is recommended that the weeding be done within 24 hours of the application.

## Weeding

1. To weed, carefully hold a corner of the excess film and removing it by pulling with sharp, short jerks at a 90 degree angle.

### *You Can Use Heat to Assist in Weeding*

Heat reduces the adhesion of the film to the substrate and makes weeding easier. It also reduces or eliminates adhesive transfer to the substrate.

Use a low wattage heat gun. Heat your work surface for 10 minutes at about 100°F (38°C). Lay the back of the substrate on the heated surface. If necessary, heat the film briefly too.

2. Use a thumb or finger to rub off any adhesive residue left on the substrate.
3. If the film extends all the way to the edge of the substrate, the fabricator needs to determine if the thickness of the film (4 to 5 mils) may interfere with the clamp hardware.

## Application

### Tip for a Successful Application

Each step of the application process is important to ensure a well-applied graphic that looks good and performs to expectations. Taking short-cuts may result in a poor appearance, inadequate adhesion, edge lifting and graphic failure.

## Procedure

1. Start with a clean work area to avoid contaminating the substrate, film or its adhesive with dirt and dust.
2. Clean the substrate immediately prior to application.

A clean substrate is extremely important to ensure proper bonding of the adhesive to the substrate.

- a. Wash the substrate with detergent and water, then rinse with clean water. Wipe dry with a clean, lint-free cloth.
- b. Saturate a clean, lint-free paper towel with isopropyl alcohol (IPA) and wipe a small area—about 2 to 3 square feet (60 to 90 square cm). DO NOT allow the solvent to evaporate; dry it with another clean, lint-free paper towel immediately.

3. Observe the recommended application temperature for film, air and substrate of 60° to 100°F (16° to 38°C).

Air, film and application surface temperature are important; they must correspond to the film's adhesive characteristics. Lower temperatures inhibit good adhesion which increases the risk of a graphic adhesion failure.

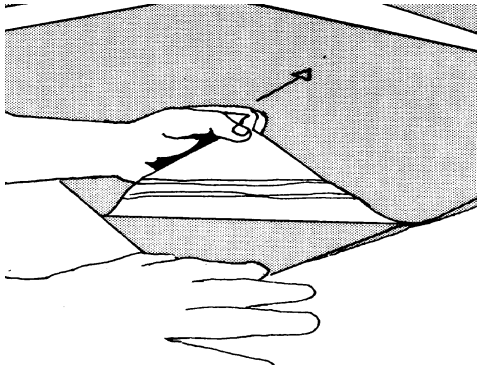
4. Use the detergent and water application method.

Other application techniques cause dark marks which become visible in transmitted light.

Notes: Do NOT get the liner wet prior to removing the liner.

Avoid wetting prespaced graphics on the non-adhesive side of the prespacing tape. Moisture is quickly absorbed into the paper tape causing the weeded areas to wrinkle and making application difficult.

- a. Prepare a wetting solution of 1 teaspoon (6 ml) of mild liquid detergent in 1 quart (1 liter) of cool water.



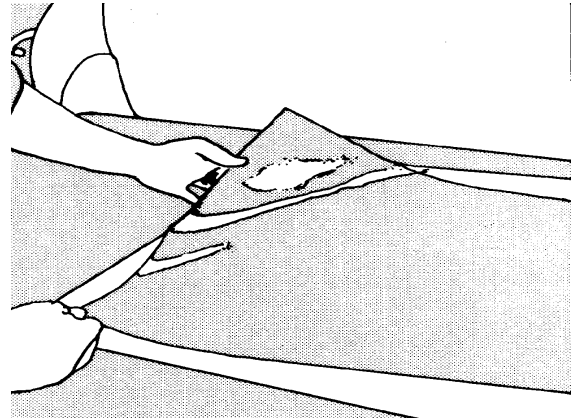
**Figure 2. Removing the Liner and Wetting the Adhesive**

- b. Hold the film face down on a clean surface and begin removing the liner from one corner. Spray the wetting solution onto the exposed adhesive. Continue in this manner until the liner is completely removed. See Figure 2.



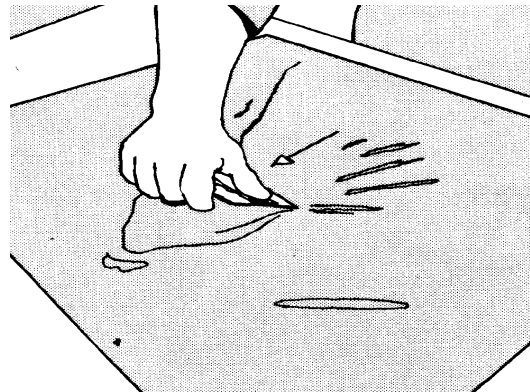
**Figure 3. Flooding the Exposed Film Adhesive**

- c. Flood the exposed adhesive side of the film with wetting solution. For small pieces of film, use a spray bottle to wet the surface. For large pieces of film use a pressurized garden sprayer. See Figure 3.
- d. Thoroughly flood the front surface of the substrate with wetting solution.



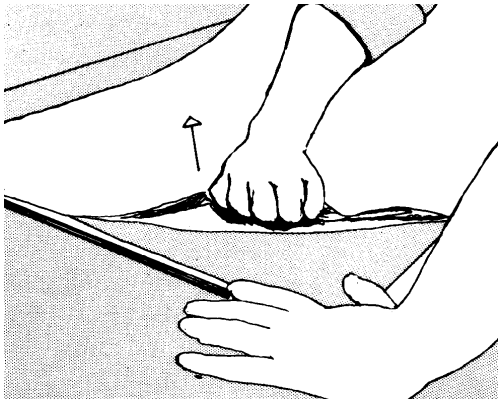
**Figure 4. Positioning Film on Substrate**

- e. Position the wet adhesive of the film against the wet substrate. See Figure 4.
- f. If the film is not premasked, spray wetting solution on the top surface.



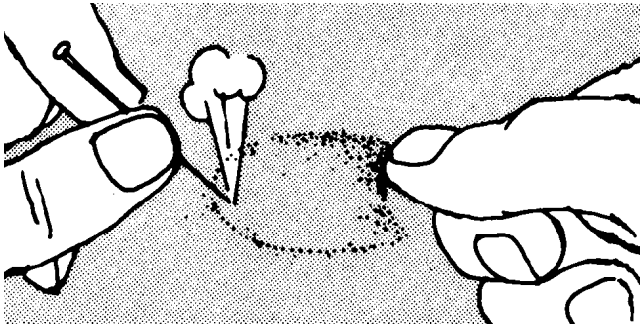
**Figure 5. Squeegeeing the Film to the Substrate**

- g. Using a 3M™ Plastic Applicator PA-1 or a large, nick-free window squeegee, and *light*, overlapping strokes, smooth out the wrinkles, squeegeeing from the center to the edges. See Figure 5.
- h. Using **ONLY** a 3M™ Plastic Applicator PA-1, make *firm*, overlapping applicator strokes to adhere the film to substrate. Squeegee from the center to the outside edges. Dry the film with a clean cloth or soft paper towel, then re-squeegee the edges.
  - If the film is premasked, continue with step 5.
  - If the film NOT premasked, go to step 6.



**Figure 6. Removing the Premask Tape**

5. Remove the premask tape, if used.
  - a. Wait 15-20 minutes.
  - b. Beginning at a corner, carefully pull the premask away from the film at a **180 degree angle**. See Figure 6.
  - c. Re-squeegee all edges.



**Figure 7. Removing Air Bubbles**

6. Remove bubbles, if there are any.
  - a. Puncture the film at one end of the bubble with a pin or other sharp, round pointed tool. **DO NOT** use a knife or razor.
  - b. Use your thumb to press out the entrapped air or wetting solution, moving toward the puncture.

**Always Re-squeegee After 24 Hours**

To properly complete the application, the film and edges **MUST** be re-squeegeed after 24 hours. If you do not re-squeegee, the edges of the graphic or even the entire graphic may lift off the substrate. This potential problem increases if pressure washing is used to clean the graphic.

The ultimate adhesion of a graphic develops slowly if the graphic is applied at or near minimum application temperatures and then immediately put into service in winter weather.

**Film Overlaps**

We recommend using an overlap when joining pieces of film rather than a butt joint, which can result in a light leak. Overlap the film pieces about 1/8 inch (3 mm). This leaves a dark line when viewed at a short distance, but is nearly invisible from a normal viewing distance. To achieve this 1/8 inch (3 mm) overlap, use the following procedure.

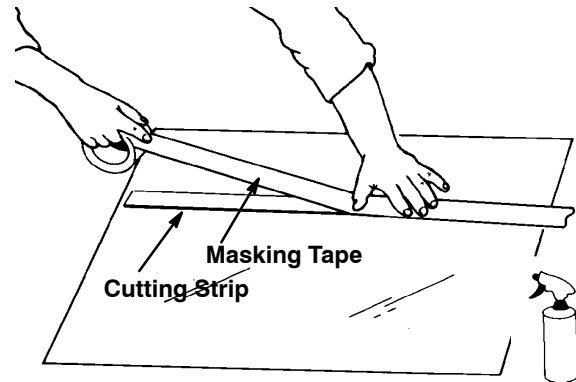
**Materials Needed**

- 2 inch (5.1 cm) wide Scotch™ Masking Tape 232
- Sharp knife or razor blade in a safety holder.
- Straight edge
- A cutting strip made from sheet metal or scrap plastic

Thickness	Width	Length
0.20–0.25 inch [3–5 gauge] (5 - 6 mm)	1.0–1.5 inch (2.5–3.8 cm)	length of seam

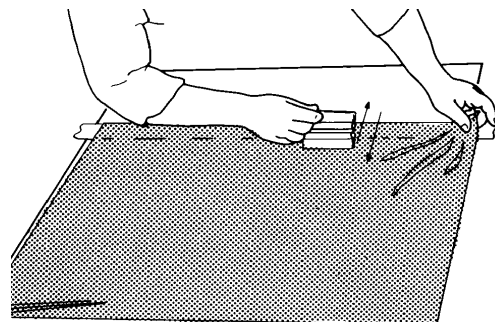
Note: The thickness of the cutting strip determines the width of the overlap.

**Process**



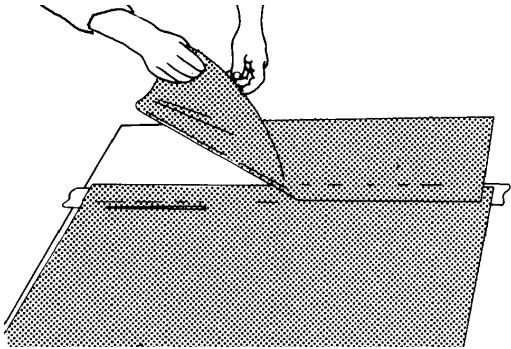
**Figure 8. Preparing and Overlap**

1. Lay the cutting strip on the substrate where the film overlap will be. Tape the cutting strip to substrate with the masking tape. See Figure 8.



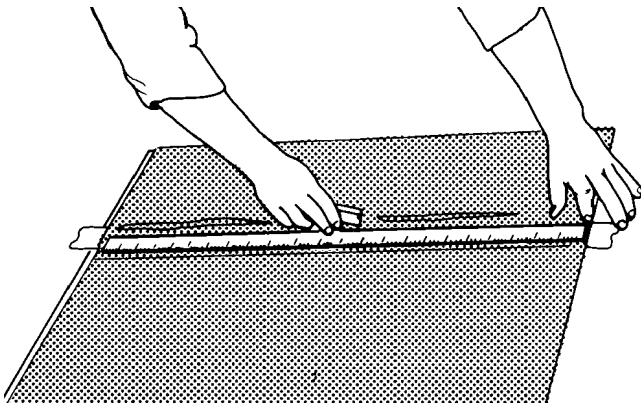
**Figure 9. Laying Down the First Piece of Film**

2. Apply the first piece of film making so it overlaps the cutting strip. Remove any premask tape from the overlap area. Apply the film as instructed under Application–Procedures on page 2. See Figure 9.



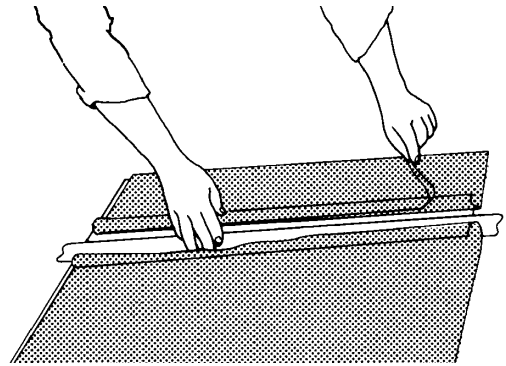
**Figure 10. Laying Down the Second Piece of Film**

3. Apply the second piece of film so it overlaps the width of the cutting strip. See Figure 10.
4. Squeegee both pieces over the cutting strip.



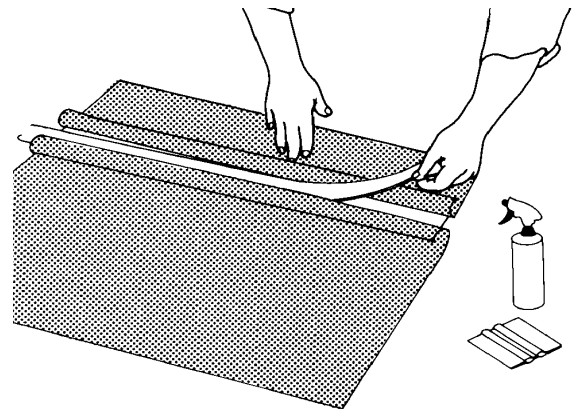
**Figure 11. Cutting Through Two Layers of Film**

5. Align a straight edge over the center of the cutting strip. Using a sharp knife or razor, cut along the entire length of the overlap through both layers of film. See Figure 11.



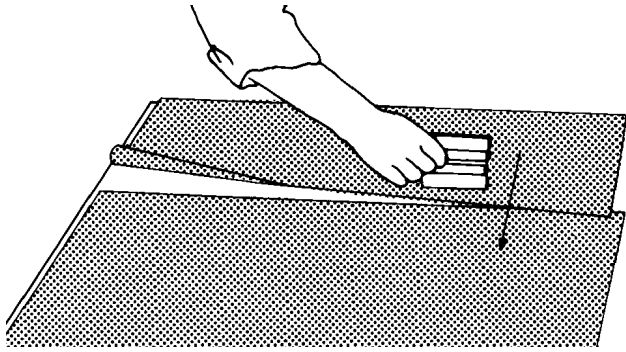
**Figure 12. Removing Excess Film After Cutting**

6. Remove the excess top film. See Figure 12.
7. Fold back the overlapped film and remove the excess bottom film.



**Figure 13. Removing the Tape and Cutting Strip**

8. Remove the tape and cutting strip. See Figure 13.
9. Apply wetting solution where the cutting strip was positioned.



**Figure 14. Squeegeeing the Overlap**

10. Squeegee the first piece of film onto the substrate and then the second piece. See Figure 14.
11. Re-squeegee after 24 hours.

## Shelf Life, Storage, and Shipping

Activity	Recommendation
Shelf life	<b>Total shelf life:</b> 1 year Up to 6 months undecorated, and an additional 6 months decorated
Storage conditions	<ul style="list-style-type: none"> <li>• Out of sunlight</li> <li>• Clean dry area</li> <li>• Original container</li> <li>• Bring all media to print room temperature before using</li> </ul>
Shipping finished graphics	<ul style="list-style-type: none"> <li>• Allow the decorated substrate to lay flat for at least 24 hours after decorating. Use brown waxed paper slip sheeting between graphics, if they are stacked.</li> <li>• To roll the decorated substrate, roll it up decorated side out, with slip sheeting, onto a core at least six inches (15 cm) in diameter. Wrap the outside of the roll in additional slip sheeting.</li> <li>• Store the rolled substrate vertically so no pressure is applied to any part of the graphics.</li> </ul>

See Instruction Bulletin 6.5 for details.

Note: Refer to the film's Product Bulletin for details on proper handling of the film.



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## 3M Related Literature

**Before starting any job, be sure you have the most current Product and Instruction Bulletins.**

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins, as well as a list of all Bulletins updated within the last three months, are available at [www.scotchprint.com](http://www.scotchprint.com) or through our Fax-on-Demand system. Any warranty, if offered, is based on information in the appropriate Bulletin(s) that was current at the time you purchased the 3M products. The following Product and/or Instruction Bulletins provide the information and processes you need to properly make the graphics described in this Bulletin.

Fax-on-Demand phone numbers:  
United States or Canada: 1-800-364-0768  
International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
<b>Instruction Bulletins</b>		
Application, general procedures for interior and exterior dry applications	5.5	7005
Using 3M application tapes; premasking and prespacing for films	4.3	6503
<b>Warranties</b>		
3M Graphics Center Warranty Brochure		9503

## Bulletin Change Summary

Films 1330 and 7025 are obsolete. This document now covers all versions of Panagraphics substrate. Other changes are marked with a black bar in the margin.