Overview

This instruction bulletin provides detailed procedures for successful, durable installation of 3M™ Cooling Film for a variety of surface shapes and applications. This includes instructions specific to challenging aspects of film application on commercial vehicles, including deep recesses and contours. Failure to follow these procedures may result in wrinkled film and/or the film lifting from contoured areas. These instructions include the critical steps of post-heating and/or edge-sealing the film after installation.

Substrate Preparation

See 3M Instruction Bulletin Application: Substrate Selection and Preparation for details on cleaning specific substrates and any special application techniques that are required.

- All substrates must be considered contaminated and must be cleaned immediately prior to film application. Dust and other contaminants can collect quickly on the substrate and prevent the film from adhering properly.
- Ensure the substrate, rivets, and seams are thoroughly dry before installing film. Film adheres poorly even to a properly cleaned substrate if it is still moist.

General Application Methods

Flat

1. Clean the substrate using appropriate cleaners and techniques. See 3M Instruction Bulletin Application: Substrate Selection and Preparation for details.
2. Set the first panel on the rear of the roof of the vehicle or trailer, holding it in place with masking tape or magnets.
3. Starting on one side of the film panel, remove as much liner as is comfortable and tack the film into position on one side of the roof.
4. Remove the entire liner and tack the film to the other side of the roof. Alternatively, installers may gradually remove the liner as they squeegee the film to the substrate. (See Step 5.)
5. Squeegee the film to the substrate. Work from the middle of the film out to each edge in order to allow air to escape from under the film.
6. If applicable, cut all seams on the roof.
7. Repeat Steps 1 through 6 with subsequent panels, moving toward the front of the vehicle or trailer. Overlap panels by 1/4 in. to 1/2 in. (0.6 cm to 1.3 cm) until the desired amount of roof is covered with the film.
8. Trim the film edges as needed.
9. Re-squeegee all edges and film after completing the entire film installation.

Corrugated Roofs

1. Clean the substrate using appropriate cleaners and techniques. See 3M Instruction Bulletin Application: Substrate Selection and Preparation for details.
   - Installers must wrap the film around corrugations. Do NOT bridge the film from one corrugation to the next and then use heat to push the film into the flat area. The film will tent in the valleys and cause premature failure.
2. Use masking tape or magnets to set the first panel to the rear of the roof so the top edge is on a flat surface.
3. Use the edge of the squeegee to bead the upper valley. See Figure 2.
4. Apply the film to the top of the corrugation with the corner of a squeegee or with a wrap glove. See Figure 3.

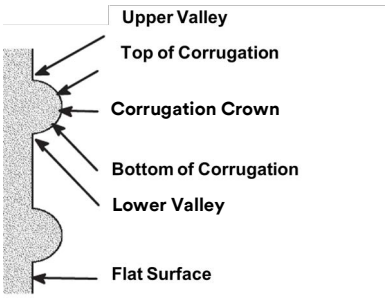


Figure 1. Profile of a Standard Corrugation

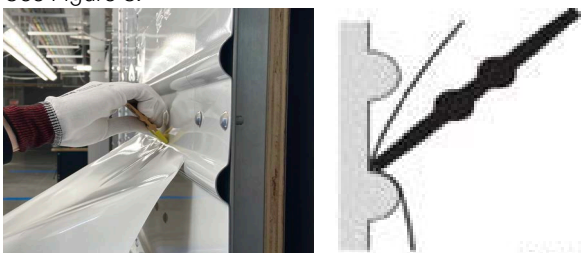


Figure 2. Bead the upper valley.



Figure 3. Squeegee the crown of the corrugation.

5. Apply the film along the crown of the corrugation using the edge of the squeegee or with a wrap glove. A second installer will need to hold the film up above the corrugations to prevent the film from pre-adhering to the roof.
6. Apply the film to the bottom of the corrugation with the corner of the squeegee. See Figure 5.
7. Use the edge of the squeegee to bead the lower valley.

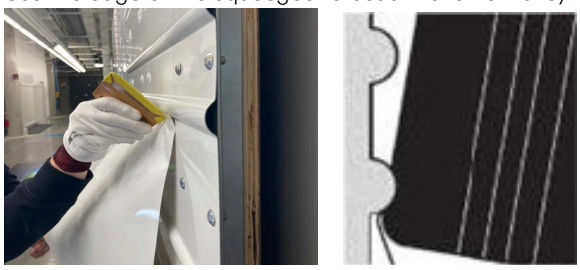


Figure 4. Squeegee the bottom of the corrugation.

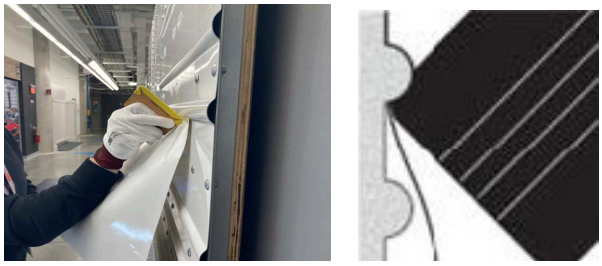


Figure 5. Squeegee the bottom of the corrugation.

8. Repeat Steps 3 through 7 on each individual corrugation under the film panel.
9. Repeat the Steps 1 through 8 for subsequent film panels, moving toward the front of the vehicle or trailer. Overlap panels by 1/4 in. to 1/2 in. (0.6 cm to 1.3 cm) until the desired amount of roof is covered with the film.
10. Trim the film edges as needed.
11. Re-squeegee all film edges and overlaps after completing the installation.

Recessed Channels

3M recommends using the corrugation application method described above whenever possible, as it places less stress on the film. Use the instructions below on areas of the vehicle where the recesses are deeper and the film must be stretched to conform to the vehicle or trailer.

Use 3M™ Tape Primer 94

3M recommends, but does not require, the use of 3M™ Tape Primer 94 to promote better film adhesion where the film will be stretched, as it reduces the chances of film lifting, and can be especially helpful in deep recesses.

- In concave channels, apply a thin layer of primer over most of the concave area. Allow the primer to dry.
- When going around convex areas, apply a thin layer of primer at the outer edges of the curve to prevent film edge lifting. Allow the primer to dry for five minutes.
- For the most effective bond, and to avoid contamination, install the film within one hour of applying the primer.

Applying Film into Deep Recesses

1. Clean the substrate using appropriate cleaners and techniques. See 3M Instruction Bulletin Application: Substrate Selection and Preparation for details.
2. Pre-split the liner in the center of the first panel.
3. Set the first panel on the roof at the rear of the vehicle with the liner in place.
4. Place a tape hinge in the center of the panel.
5. Remove one side of the liner and lightly anchor the film to the substrate.
6. Remove the other side of the liner and lightly anchor the film to the substrate at the high points.
7. Pull the edges of the film to provide light tension and minimize any wrinkles.
8. Thoroughly squeegee the film to all of the high points of the roof. Work from the middle of the film out to each edge to allow air to escape from under the film.
9. Use a wrap glove to lock the film to the edges of the recessed channels.
10. Apply heat to soften the film over the recessed channels. Work in manageable sections.
11. Use a wrap glove to lock the film in to the valleys until the perimeter of the protrusion or recess is sealed off. Use firm pressure to ensure there is no air trapped in the valleys.
12. Squeegee the film to the flat of the channels. Start in the middle and work towards the edges to most effectively remove any trapped air.
13. Repeat Steps 1 through 11 for subsequent panels, moving toward the front of the vehicle and overlapping panels by 1/4 in. to 1/2 in. (0.6 cm to 1.3 cm).
14. Trim the film edges as needed.
15. Re-squeegee all film edges and overlaps to ensure good adhesion.

Post-Heating

1. After installation is complete, apply heat to the film to reduce its internal stress.
   a. Adjust the heat source so the film temperature reaches 200°F to 225°F (93°C to 107°C).
   b. Move the heat source slowly across the stretched film surface.
   c. For the best performance, press stretched film while the vinyl is still hot. This helps fully wet-out the adhesive onto the substrate and reduces the risk of lifting.
2. Strive for bubble-free applications. Although puncturing air bubbles improves the appearance of the film, it can contribute to premature failure if the film is torn or cut rather than neatly punctured.

   When removing bubbles is necessary:
   a. Reheat film (especially in any recessed areas and deep channels) with a heat gun. This can help detect overlooked air bubbles.
   b. Puncture any remaining air bubbles with the 3M™ Air Release Tool 391X or a pin.
   c. Firmly push any trapped air out the puncture hole with a squeegee

⚠ CAUTION

The 3M™ Air Release Tool 391X has a sharp point.

3. Re-squeegee all edges and overlaps to ensure good adhesion before releasing the vehicle for use.

Edge Sealing

Edge sealing improves the film's resistance to environmental damage and enhances its durability. 3M recommends using one of these options on film edges:

- 3M™ Edge Sealer 3950
- 3M™ Edge Sealer 4150S
- 3M™ Edge Sealer Tape

NOTE

Improper application may result in edge lifting. Apply the edge sealer consistently along the length of the exposed edge, and then allow the edge sealer to fully cure.

The edge sealer also increases the film's resistance to fluids at the film edges.

3M recommends edge-sealing the following areas:

- Leading edges of the film
- Edges where the film has been cut for doors, access panels, and similar items
- Any cut-out repair areas where new film overlaps the original film

NOTE

For high-speed applications, 3M requires the use of an edge sealer for all exposed edges.

Using 3M™ Edge Sealer Tape

1. Re-squeegee the film edges.
2. Clean and then dry all film edges.
3. Peel the liner back from 3M™ Edge Sealer Tape by approximately 3/4 in. (19 mm).
4. Using a wrap glove, press the exposed adhesive of 3M™ Edge Sealer Tape over the film seam or overlap, ensuring the seam or overlap is in the middle of the tape.
5. Use firm, even pressure to apply the tape to the seam or overlap, pulling the liner as the tape is applied.
6. Cut the edge of the tape with a knife to ensure a clean edge.
7. Repeat Steps 3 through 6 on all other film seams and overlaps.
8. Re-squeegee the applied 3M™ Edge Sealer Tape over all of the seams and overlaps.

Using 3M™ Edge Sealer 3950 or 3M™ Edge Sealer 4150S

1. Load the felt dauber or a 1/4 in.-wide brush (0.6 cm-wide brush) with edge sealer.
2. Wipe any excess edge sealer off the dauber or brush.
3. Pull the dauber or brush in a smooth, continuous motion so the sealer spans approximately 1/8 in. to 1/4 in. (3 mm to 6 mm) on the film and substrate on both sides of the film edge. Ensure the entire edge is covered with no gaps. See Figure 6.
4. Allow the edge sealer to air dry for 24 hours prior to returning the vehicle or trailer to service.

NOTE

Use opened sealer within 2 hours and discard any used sealer.



Figure 6. Applying Edge Sealer

Post-Application Conditions

Keep the vehicle or trailer temperature above 60°F (16°C) for a minimum of 12 hours. This strengthens the film's bond to the substrate.

For applications using edge sealer, allow the edge sealer to air dry for 24 hours before returning the vehicle or trailer to service.

Maintenance and Cleaning

Clean 3M™ Cooling Film a minimum of four times per year, and more frequently in dirty environments, to maintain the film's cooling performance.

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

Health and Safety

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 this link to obtain SDS sheets for 3M products.

Follow this link to obtain information about substances of very high concern (SVHC) for EU products.

Tools and Equipment Usage

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

Ergonomics

Any activity performed for a long period of time in an awkward position or with a high amount of force is potentially a risk for causing musculoskeletal strain, pain or injury. When applying or removing graphics, follow these practices to improve comfort and avoid injury:

- Alternate your tasks during the application.
- Schedule regular breaks.
- Perform stretches or do exercises to improve circulation.
- Avoid awkward reaching.

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Commercial Branding and Transportation
3M Center, Building 223-3N-30
St. Paul, MN 55144

1-800-328-3908
3M.com/Graphics

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