Standard Operating Procedures

3M Graphic Applications for Rail Car Exteriors

November 2020

Installation Methods for External Rail Applications

These Standard Operating Procedures are intended to provide installation guidance for external application of 3M™ Graphic Films to passenger rail cars. Each section of the manual addresses various techniques that are recommended for application of graphics. Graphic layouts and rail car types are subject to change, please consult your local contact for design specifications.

Please follow all installation safety standards for your respective country.

▷ **Health and Safety**

▷ **3M Warranty**

▷ **3M Disclaimer**

▷ **Important Documents**

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⚠️ Health and Safety

This information is applicable to many of the procedures in this Bulletin. Please read and follow them.

CAUTION:

When handling any chemical products, be sure to read the manufacturers' container labels and Safety Data Sheet (SDS) for important health, safety and environmental information. To obtain SDS sheets for 3M products go to 3M.com/SDS, or by mail or in case of emergency, call 1-800-364-3577 or 1-651-737-6501.

To avoid exposure to potentially hazardous materials, which if not avoided can cause serious bodily harm, wear appropriate Personal Protective Equipment (PPE) as recommended by the product manufacturer, or as deemed necessary based on the results of an exposure assessment. Such PPE may include impervious gloves (for example, butyl rubber gloves) and eye protection such as safety glasses or goggles.

When using any equipment, always follow the manufacturers' instructions for safe operation. 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.
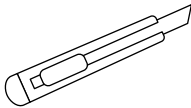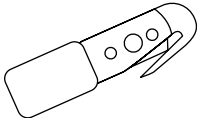
AIR QUALITY REGULATIONS:
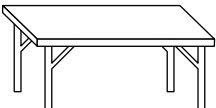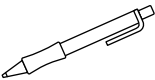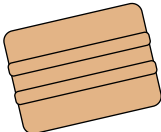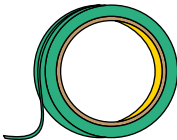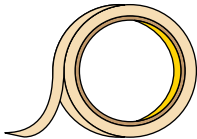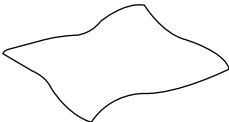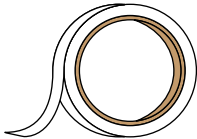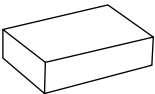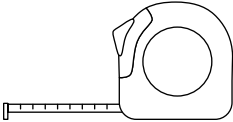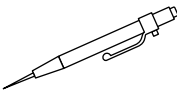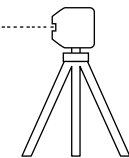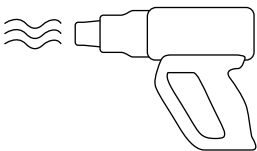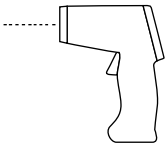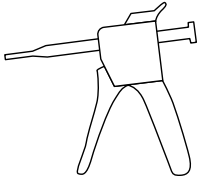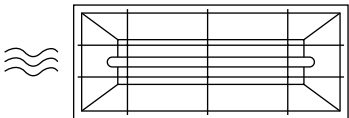
Local Volatile Organic Compound (VOC) regulations may prohibit the use of certain cleaning chemicals with Voc's in graphic arts coatings and printing operations. For example, the California South Coast Air Quality Management District prohibits use of certain solvent-based solutions without a permit and other California AQMD's prohibit use of certain solutions without a permit or a regulatory exemption. Check with local environmental authorities to determine whether use of any solutions may be restricted of prohibited.

Materials & Tools

Spray bottle		Razor knife	
Detergent/soapy water		Liner cutter (Seam buster)	
Degreaser		Table	
70% isopropyl alcohol (IPA) and 30% water mixture		Safety glasses	
Pen		3M™ Hand Applicator PA1-G Gold Squeegee	
Wrap glove		3M™ Knifeless Tape	
Disposable gloves		Masking tape	
Scotch-Brite® High Performance Cloth or lint-free cloth		Edge sealing tape	
Non-abrasive scrubbing pad		3M™ Graphic Films	
Tape measure		3M™ 391x Air Release Tool	
Laser level		3M™ Adhesion Promotor	
Heat gun		3M™ Edge Sealer / Application Brush	
IR Thermometer		3M™ Scotchweld™ EPX Manual Applicator	
IR Heater			

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Operating Conditions

Location

Well-lit, clean and dry indoor environment

Temperature

10°C – 38°C (50°F – 100.4°F)
*For specific installation temperatures, reference
the product bulletins for the graphics being used.*
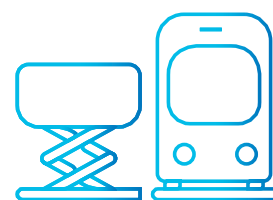
Relative Humidity

10% – 90%

Equipment

Fixed electric lift platform
*Electric lift platform shall be the full length
of the railway vehicle coach*
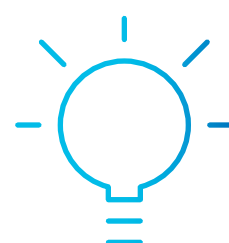
OR

Mobile electric lift truck
*At least two (2) electric lift trucks shall be
equipped for each railway vehicle coach*

Illumination

400lx or greater

*Movable LED light source shall be equipped as
auxiliary lighting in case of insufficient illumination*

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3M™ Enhanced Cleaning Method

3M recommends establishing this cleaning method as a best practice for every film adhesion test as well as every actual film installation.

Follow your country's safety regulations for using degreaser and cleaning.
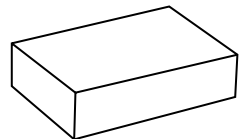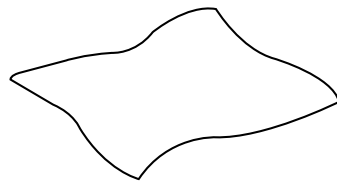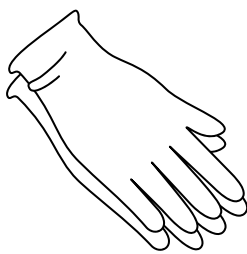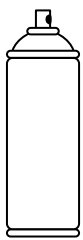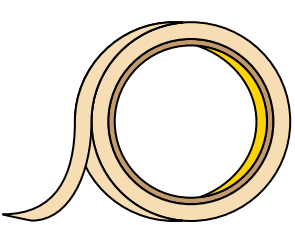
Prepare substrate

Cleaning the application area can reduce the gloss of the paint. Mask off the size of the graphic and clean only within that area.

Clean stubborn grease and grime with your preferred method.

ⓘ **A non-abrasive scrubbing pad and cleaning cloth can be used to remove more aggressive dirt and residual.**
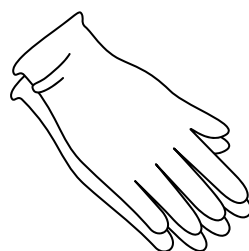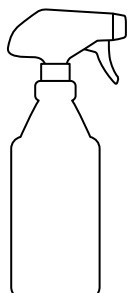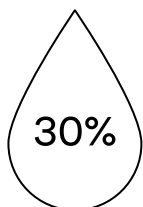
Prepare cleaning solution

Prepare a cleaning solution with 70% Isopropyl Alcohol (IPA) and 30% water in a spray bottle.

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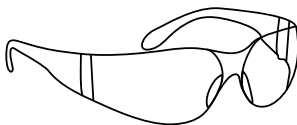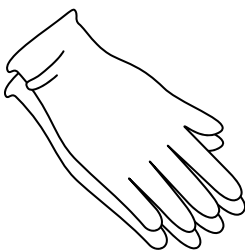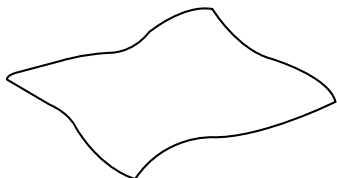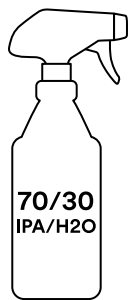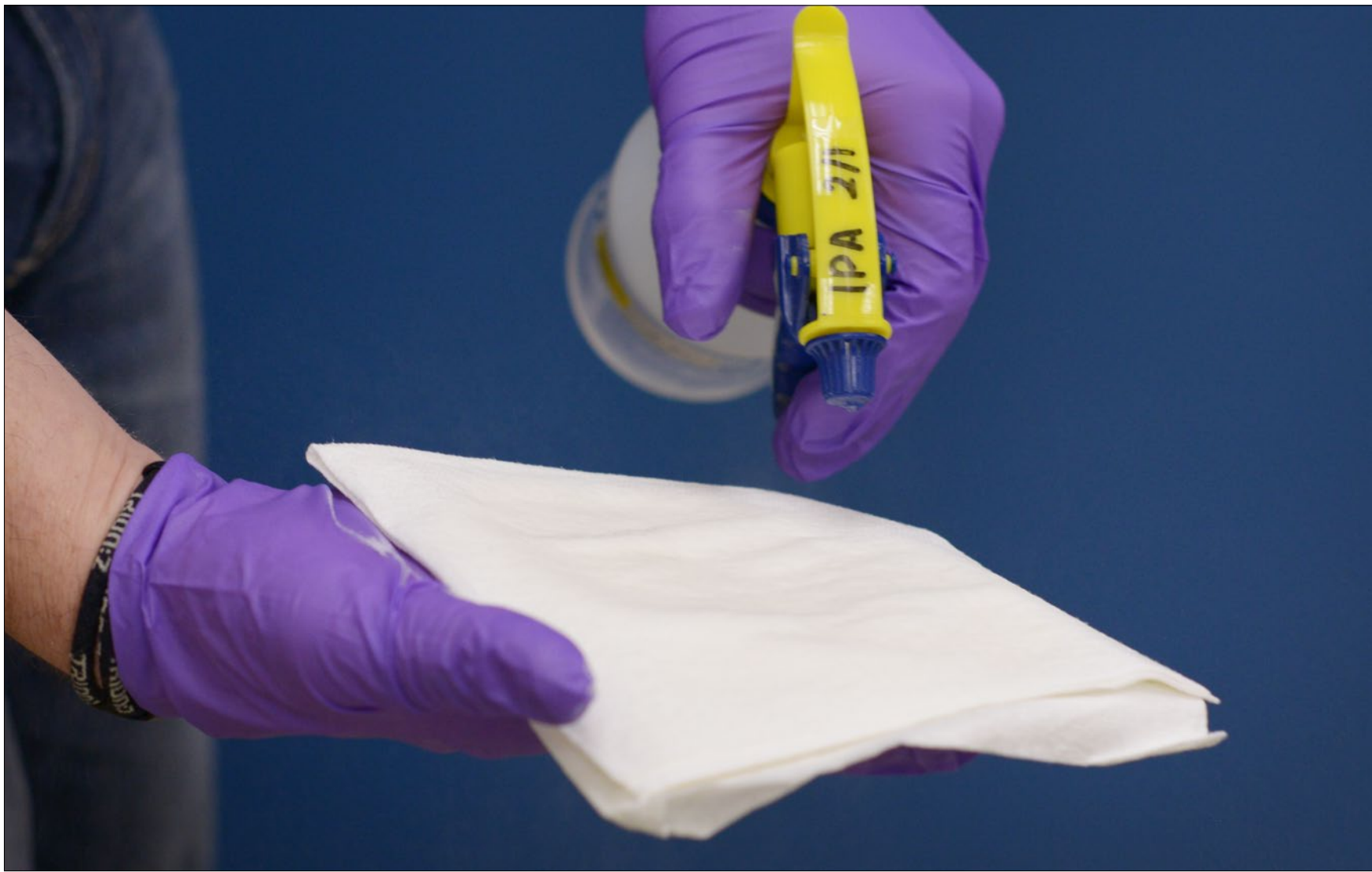
Apply cleaning solution to cloth

Soak a clean, lint-free cloth with the cleaning solution until it is dripping wet.

3M™ Enhanced Cleaning Method
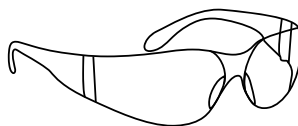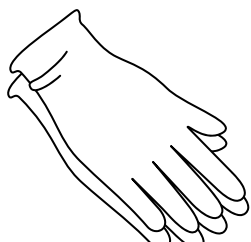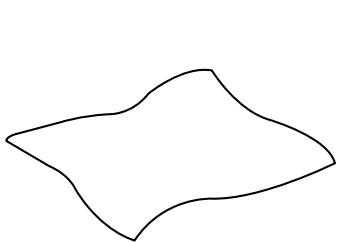
Wipe application area

Clean the application area with overlapping strokes. If you notice some migrated paint particles on the cloth, replace the cloth and repeat cleaning.

(!) **Change cleaning cloths often to avoid redepositing contaminants on another part of the substrate. Soak each new cloth with cleaning solution.**

(!) **For your safety, always wear protective eye wear and disposable gloves when cleaning substrates.**

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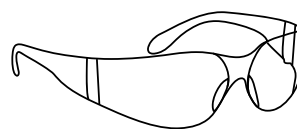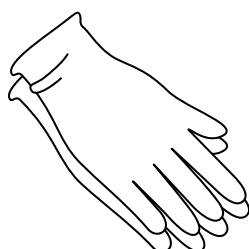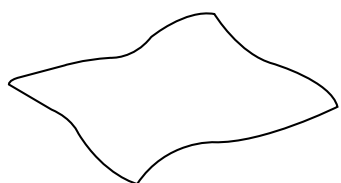
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Repeat cleaning

Thoroughly soak another clean, lint-free cloth with the cleaning solution and wash the surface again.

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Dry Time
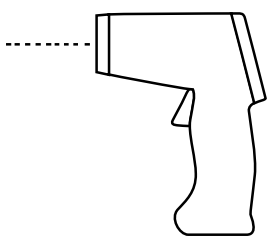
Allow area to completely dry

The alcohol in the cleaning solution will lower the surface temperature of the surface by as much as 10°C (50°F) — a noticeable difference. When the alcohol has completely flashed off, the substrate will return to its normal temperature.

You can use an IR gun to accurately measure the temperature before cleaning and immediately after cleaning, or simply touch the back of your hand to the cleaned area. When it no longer feels cool, it is dry and you can proceed with the film installation.

3M™ Enhanced Cleaning Method
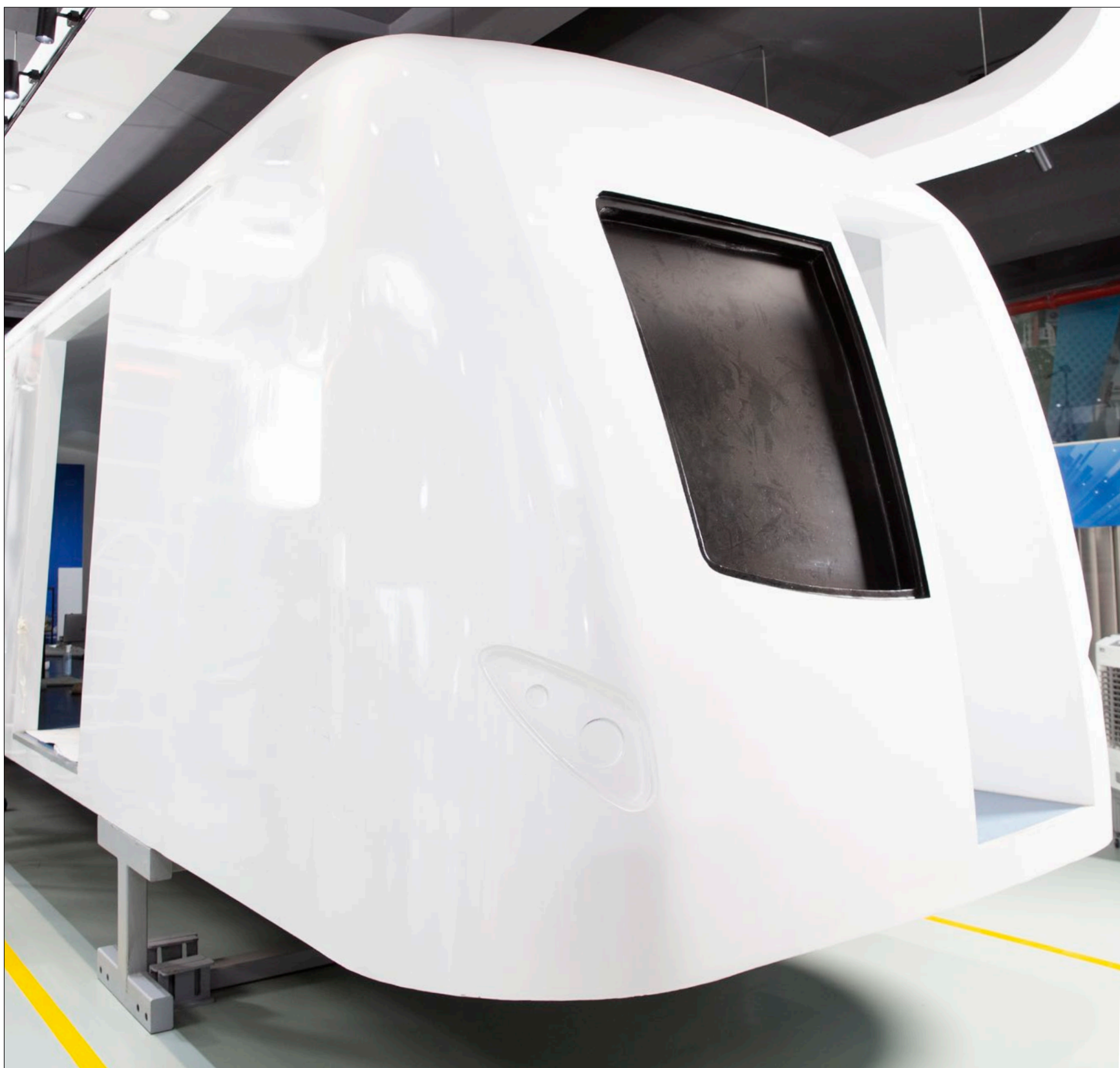
Cleaning complete

See **Instruction Bulletin 5.1 — Select and Prepare Substrates for Graphic Application** for more information regarding cleaning methods for specific substrates.

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Vertical Panel Application
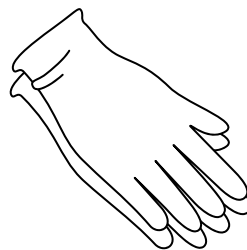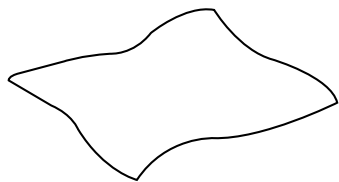
3M Adhesion Promoter

Prep surface

Prep the substrate as required including cleaning, fixing any damaged areas, cleaning again and using an adhesion promoter on all corners and edges where applicable.
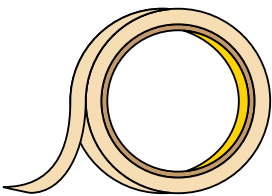
Position Panel 1

Position Panel 1 and use masking tape to temporarily secure in place.
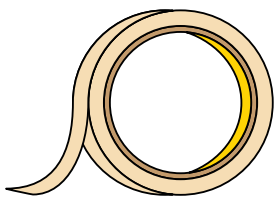
Position Panel 2

Align Panel 2 and masking tape it in place. Tape it enough that it will not move and lose alignment when you fold it back.

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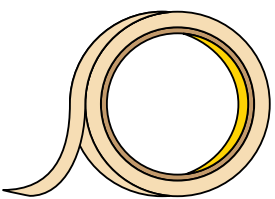
Secure Panel 2 — out of the way

Fold back part of Panel 2. Use masking tape to hold it out of the way to work on Panel 1.
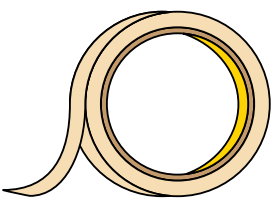
Hinge Panel 1

Make a masking tape hinge on Panel 1 about 30cm (12") down from the top.
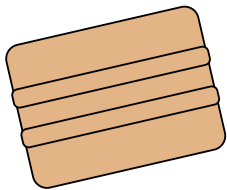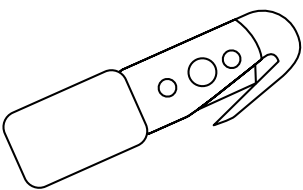
Remove Panel 1 liner—above hinge

Above the hinge, peel back the liner and cut off the liner as straight as possible.

> ⚠ **Make sure that the blade is sharp before cutting the liner. If the edge of the liner is frayed, some of the edge fibers may adhere to the adhesive during squeegeeing. These fibers can be difficult to remove from the adhesive.**

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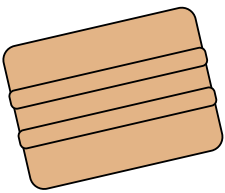
Apply Panel 1— above hinge

Begin to squeegee 1" (2.5 cm) above the hinge, starting in the center and working out toward the edges. Using firm overlapping strokes to apply the film.

> ⊘ Remember to emphasize the 2 o'clock and 10 o'clock position of the squeegee. If the squeegee is completely vertical, you WILL get bubbles and wrinkles.
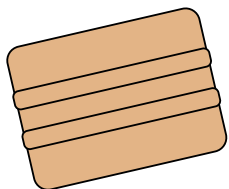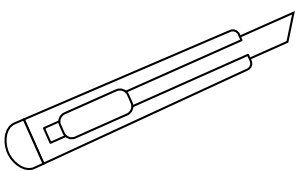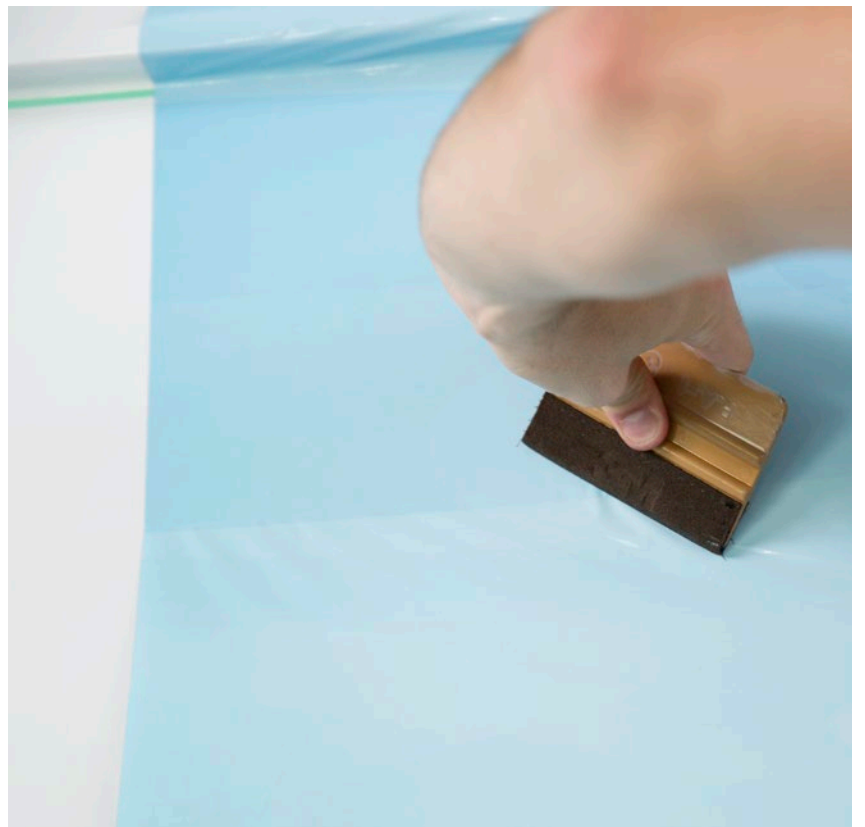
Apply Panel 1— bottom

Remove the tape hinge and peel back the liner. Apply Panel 1 all the way down to the bottom peeling the liner as you go. Use firm, overlapping stokes starting in the center and working the film out to both edges. You may need to apply some slight tension to keep the film flat. In this case, you will add tension in the middle of the graphic only and use your open hand to distribute the force.
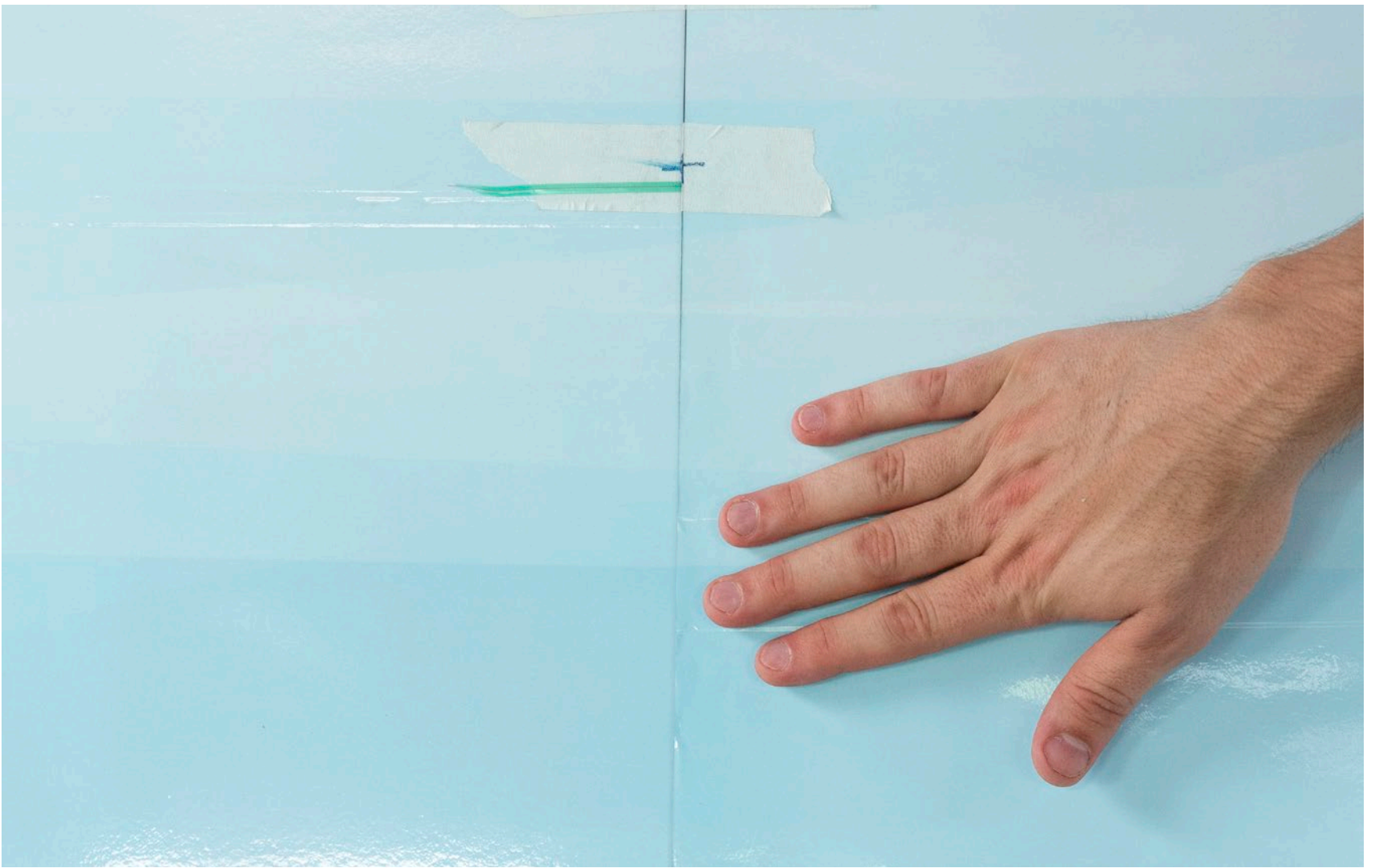
Panel 2 alignment

With Panel 1 installed, remove the masking tape holding Panel 2 back and ensure it is properly aligned.
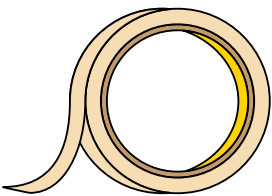
Hinge Panel 2

Make a masking tape hinge on Panel 2 about 30cm (12") down from the top to secure it in place.
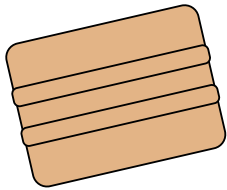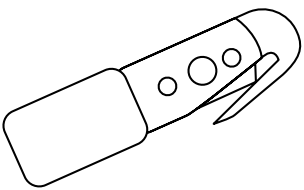
Apply Panel 2

Apply Panel 2 using the same method as Panel 1. The two panels should be perfectly aligned.

Vertical Panel Application
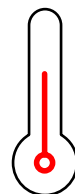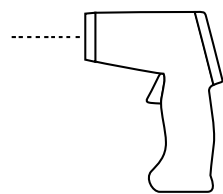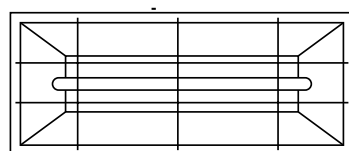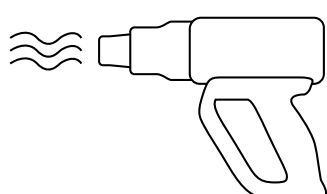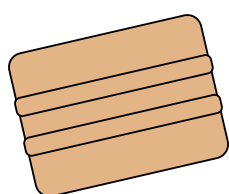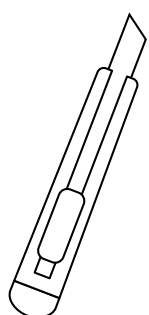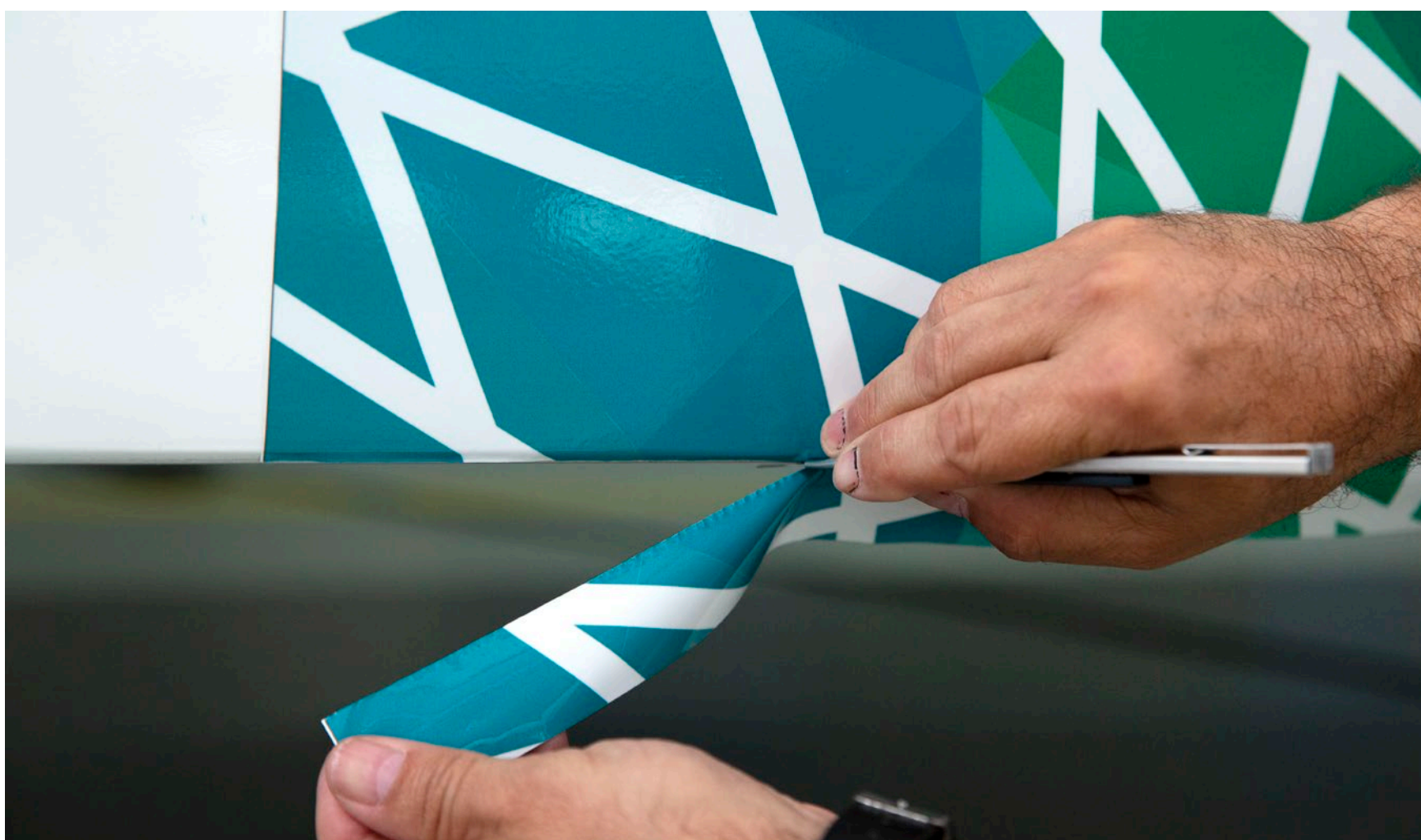
90 – 110°C

Trim bottom panels

Once all the panels are installed, trim the panels on the bottom by running the blade parallel with the bottom of the car. To finish the installation, re-squeegee and post heat all edges and seams.

⊘ **Use IR heater on full graphic.**
Temperature Range 90 – 110°C (194–230°F)

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Cutting
Window Edges
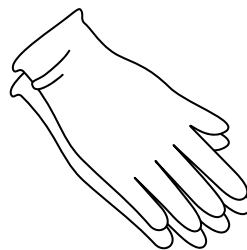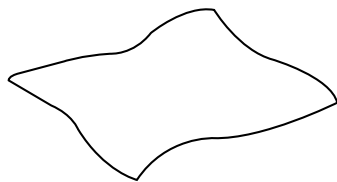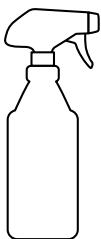
Prep surface

Prep the substrate as required including cleaning, fixing any damaged areas, cleaning again and using an adhesion promoter on all corners and edges where applicable.
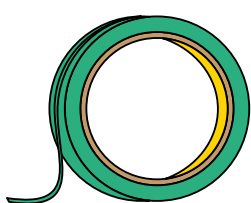
Apply Line 1

Apply Line 1 on the outside edge of the window. Make the tails of the Knifeless tape 15–20cm (6–8") and finish within the window. The inside edge of the tape should be flush to the edge of the black molding. Line 1 will be used to cut the film around the window.

ⓘ Be sure not to apply the Knifeless tape on top of the molding.
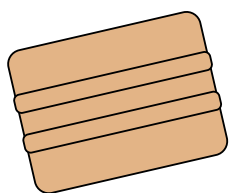
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Apply graphic

Use a squeegee to apply the graphic film. Graphic will cover the window.

Cut hole to access Line 1

Using a knife, cut a hole in the film over the window to access to the Line 1.

Starting with the tail of the Knifeless tape that was applied last, pull the tape through the hole and separate the filament from the green backing.

⊙ **Be careful not to cut the glass underneath.**

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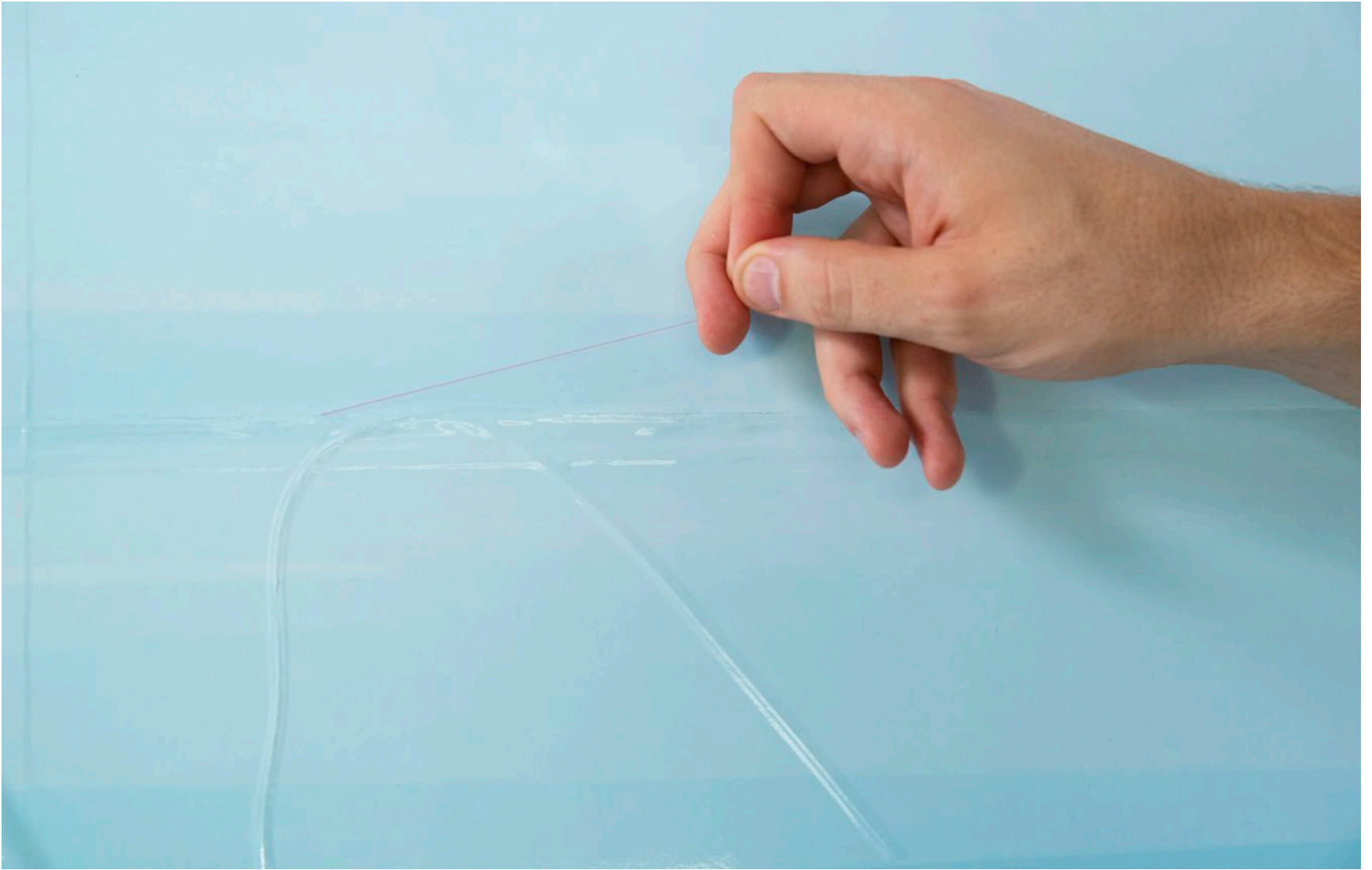
Cut film around window

Pull the Line 1 filament all the way around the window without stopping, finishing where the Knifeless tape was first applied. Then, pull out the remaining tape pieces.

Remove excess film from window area

Peel off/remove the excess graphic film that is covering the window.

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Cutting Window Edges
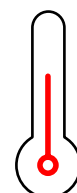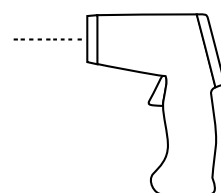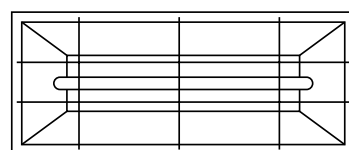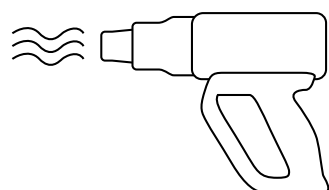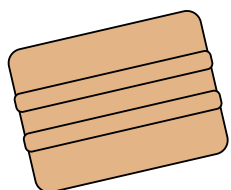
90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges and seams.

⚠ **Use IR heater on full graphic.**
  Temperature Range 90– 110°C (194–230°F)

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Perforated Window Film
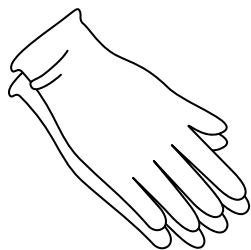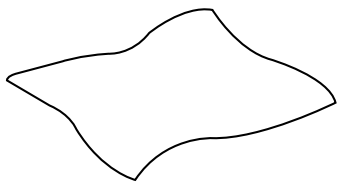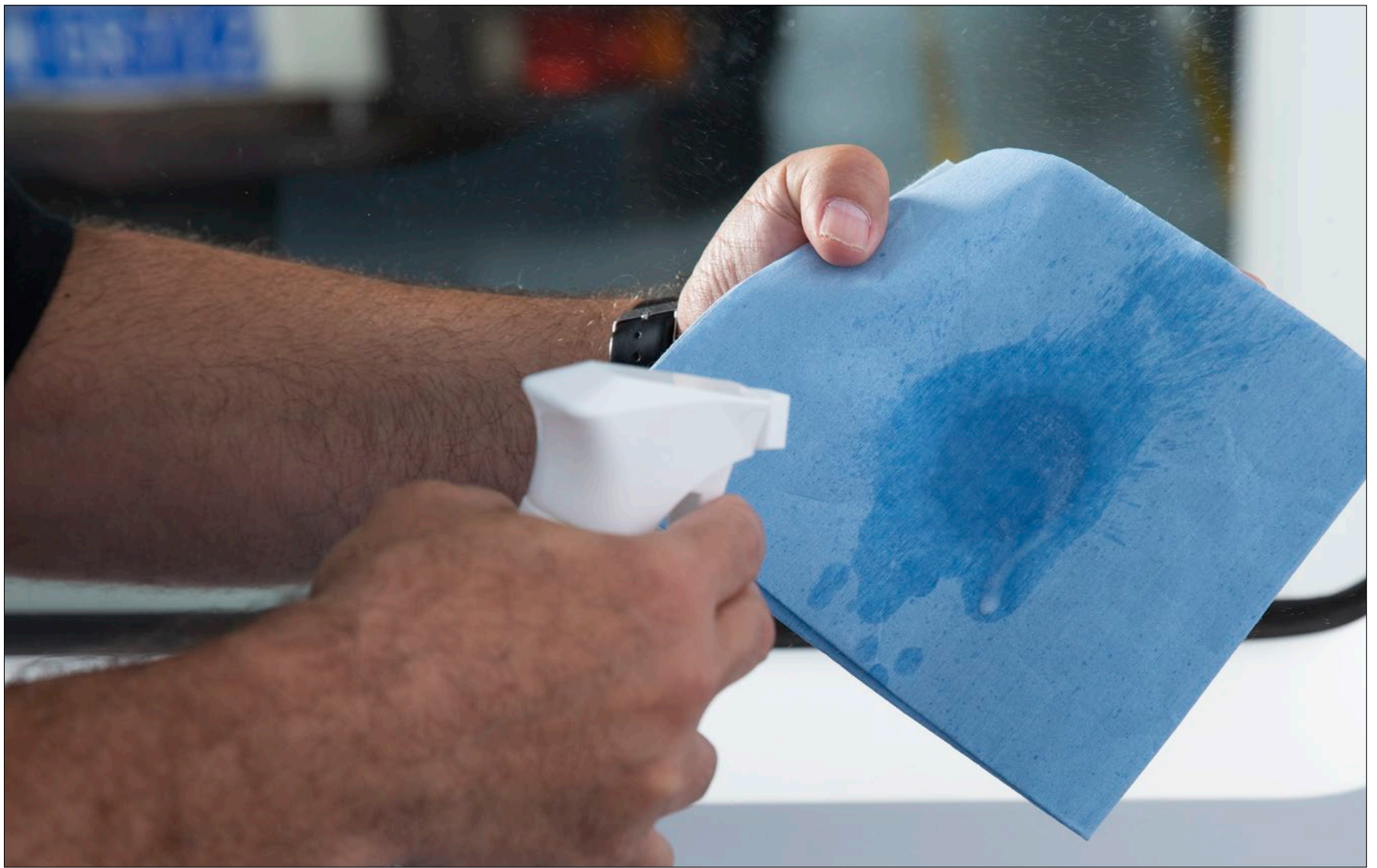
Prep surface

Prep the substrate as required, noting any damage or repairs needed. Clean again.

Perforated Window Film
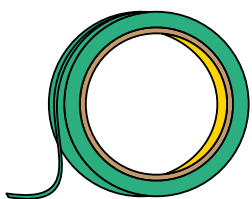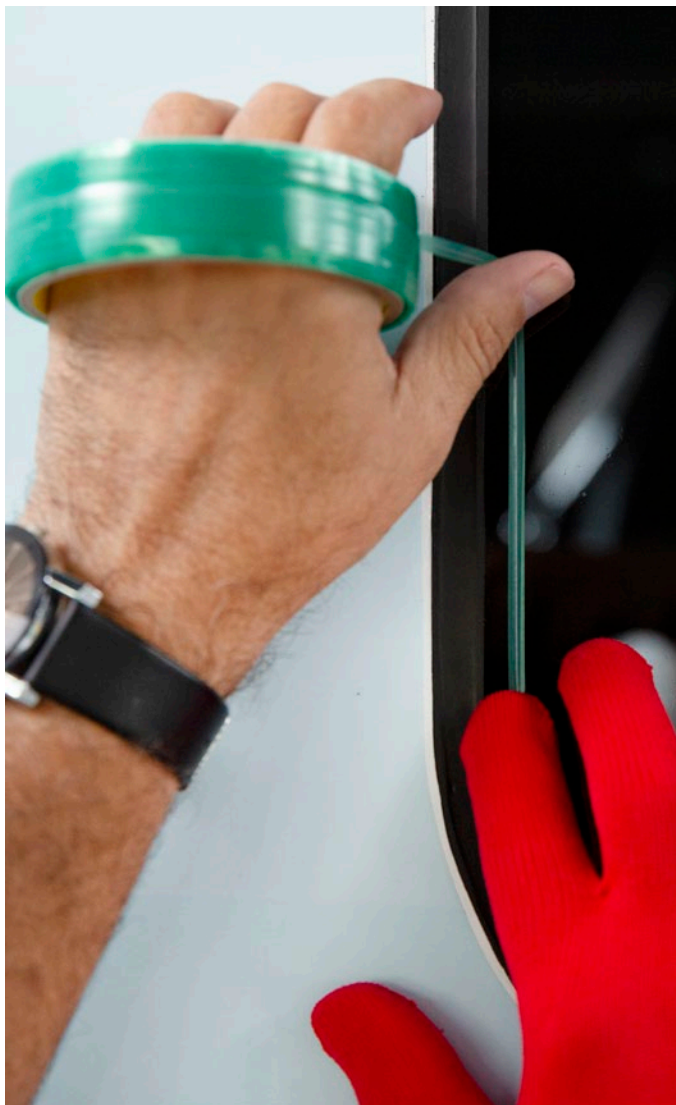
Apply Line 1

Apply Line 1 at 6mm (¼") inside the edge of the glass. Make sure to leave a 10 – 15cm (4 – 6") tail at the end of the Knifeless tape. Line 1 will be used to cut the film around the window.

ⓘ **Do not apply the tape on top of the molding.**
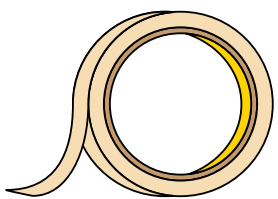
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Position window film

Position the window film with respect to the registration points on the exterior panels surrounding the window film.

The design should align across all panels.
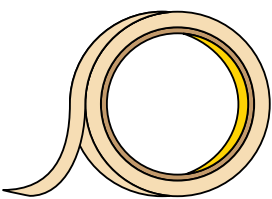
Secure window film

Once window film is aligned, use the hinge method to secure it in place.
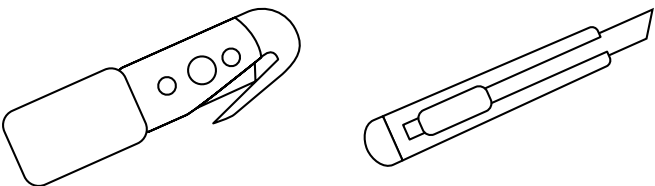
Peel liner

Peel the liner away from the window film. Using a liner cutter or knife, cut the liner and remove.
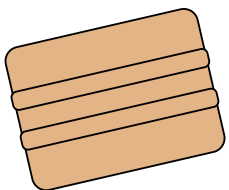
Apply window film

Apply the window film with a squeegee using firm overlapping strokes. Start the squeegee in the middle of the panel and apply the film from center out to the edges.
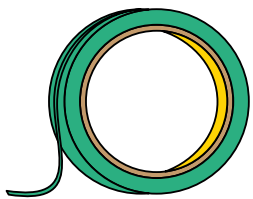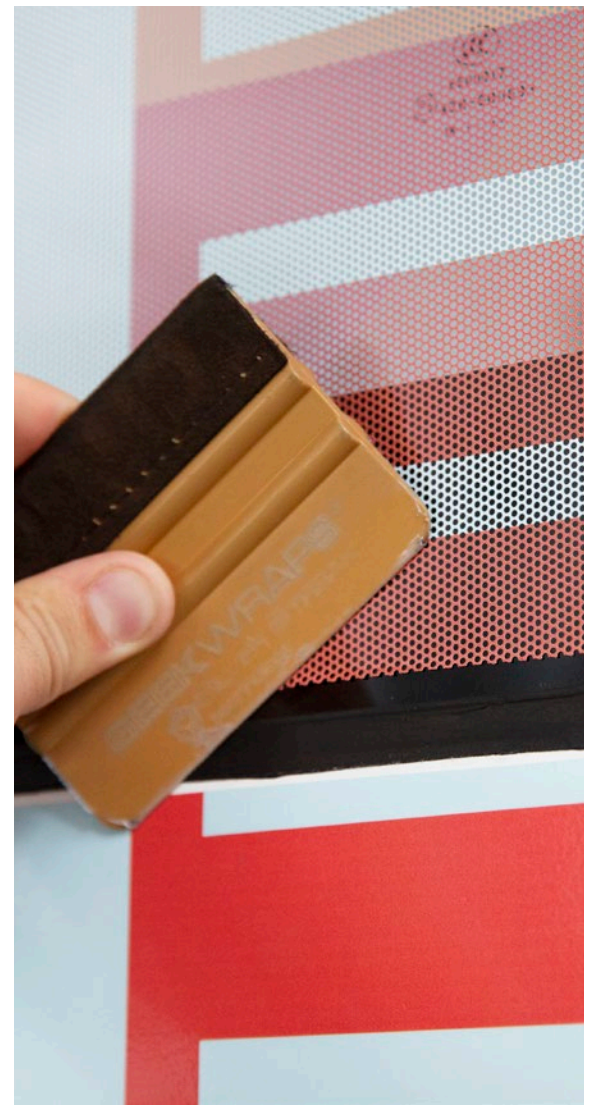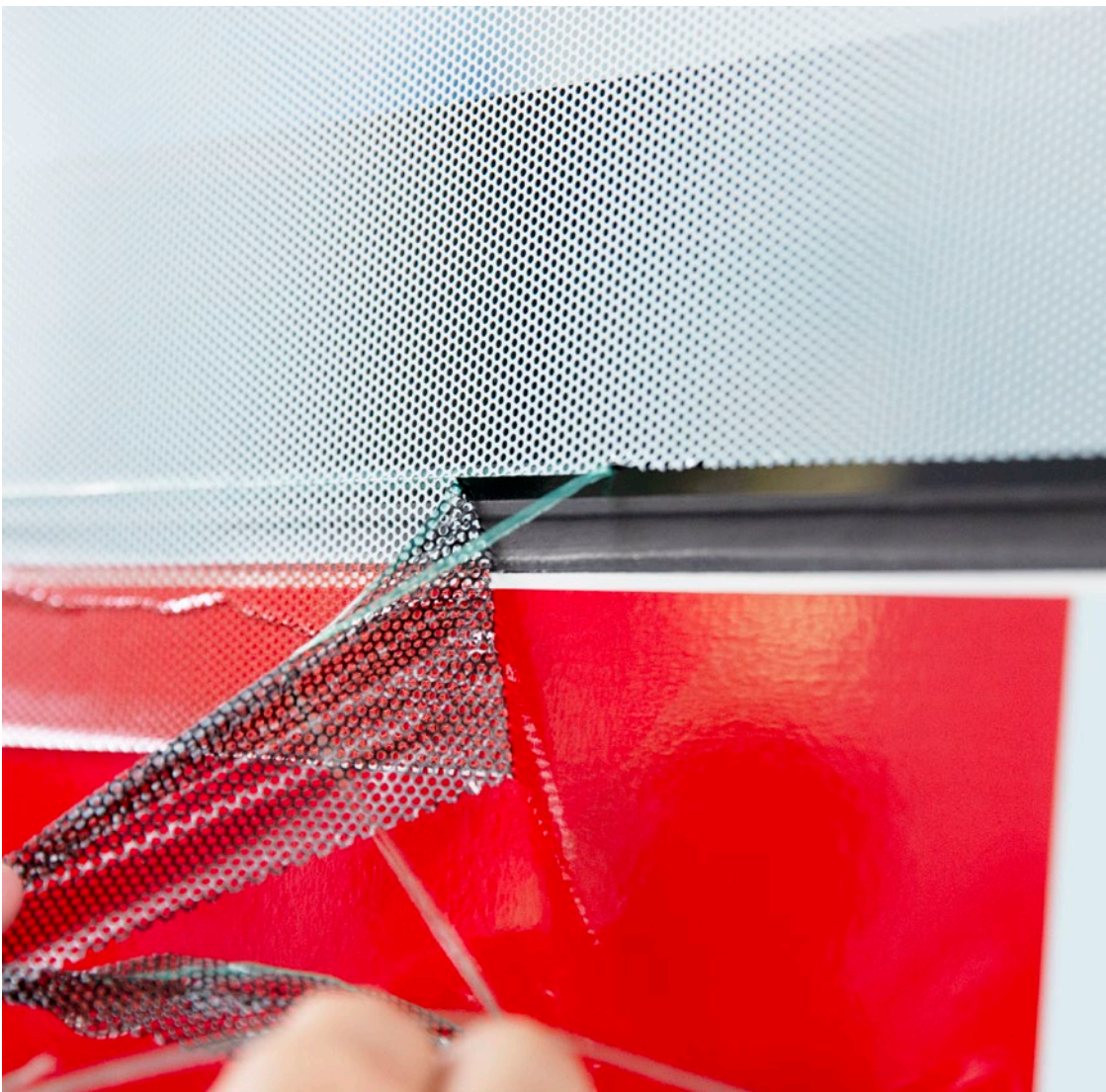
Trim window film

Once the window film has been applied, pull Line 1 to cut the edge of the film.

⚠ **If the Knifeless tape is not used to trim the window film, a knife with a stainless steel blade can also be used to cut the film back 6mm (¼") from the glass edge.**
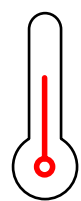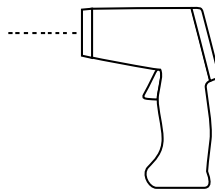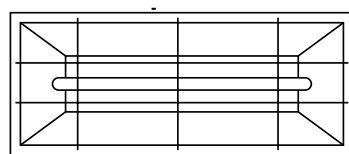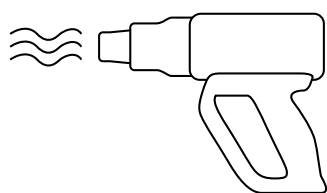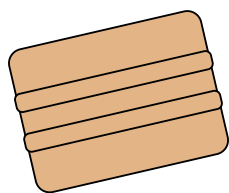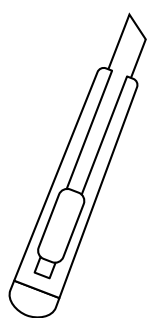
90–110°C

Finish application

Use an edge sealing method to seal film. To ensure seam is encapsulated, apply edge sealer or edge tape with 6mm (¼") of sealer on both sides of the seam. To finish the installation, re-squeegee and post heat all edges and seams.

ⓘ **Use IR heater on full graphic.**
Temperature Range 90 – 110°C (194–230°F)

Decal — Top Hinge Method

Decal — Top Hinge Method

Prep surface

Prep the area by cleaning the film surface where the decal will be placed to ensure proper adhesion to the bottom layer of film.

Position and tape

Position the decal and use masking tape to temporarily secure it in place.

Top hinge

Put a top hinge across the decal.

> ⊘ Once the hinge is applied, ensuring the decal is in place, cutting the decal between various elements — up to but not including the hinge — can help to make the decal more manageable.
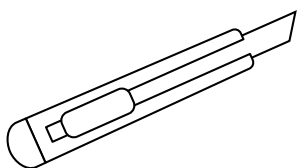
Remove liner

Peel the liner back from the decal and remove or cut the liner. Pull the liner from the graphic. Be careful to not peel the film away from the application tape.
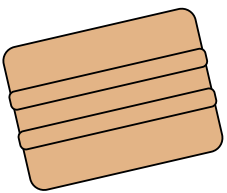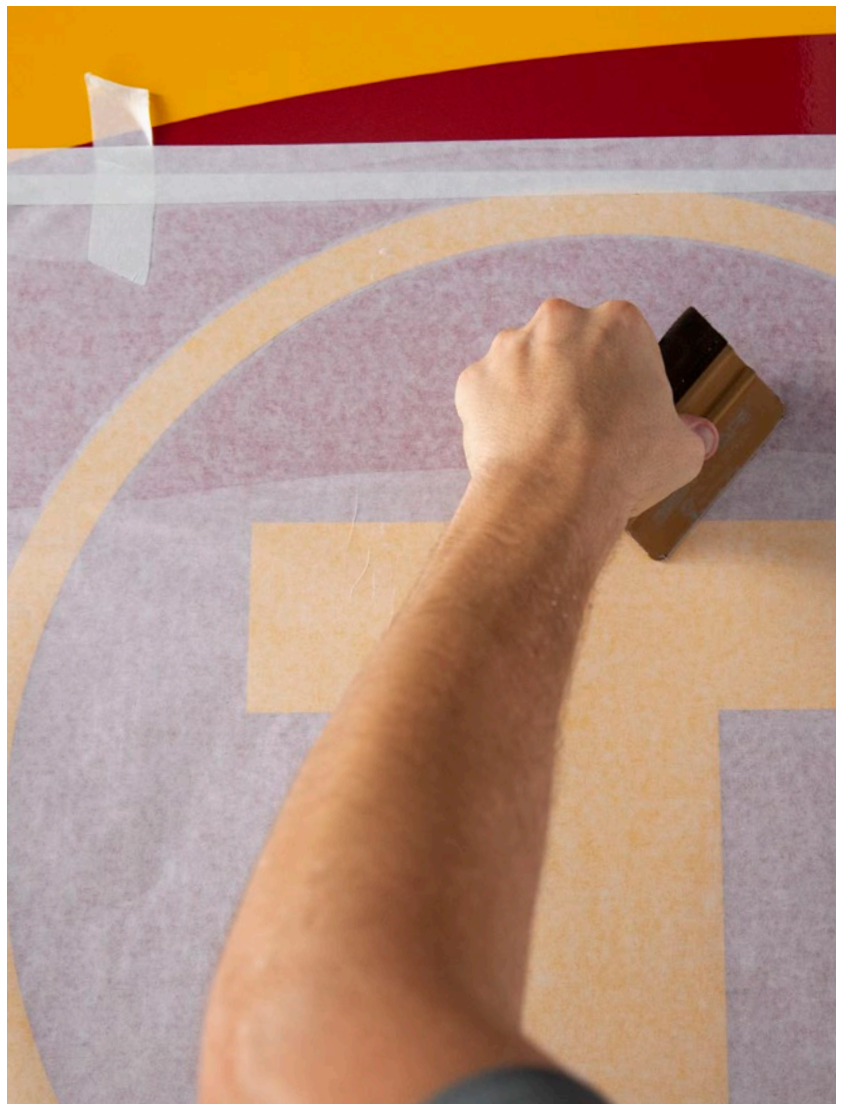
Apply decal

Confirm the position of the decal and apply with a squeegee using firm overlapping strokes.

Remove application tape

Once the decal has been applied, remove the application tape. Starting at a corner, pull the tape back on itself at about a 180 degree angle. Pull evenly and smoothly to prevent lifting the decal from the surface.

Decal — Top Hinge Method
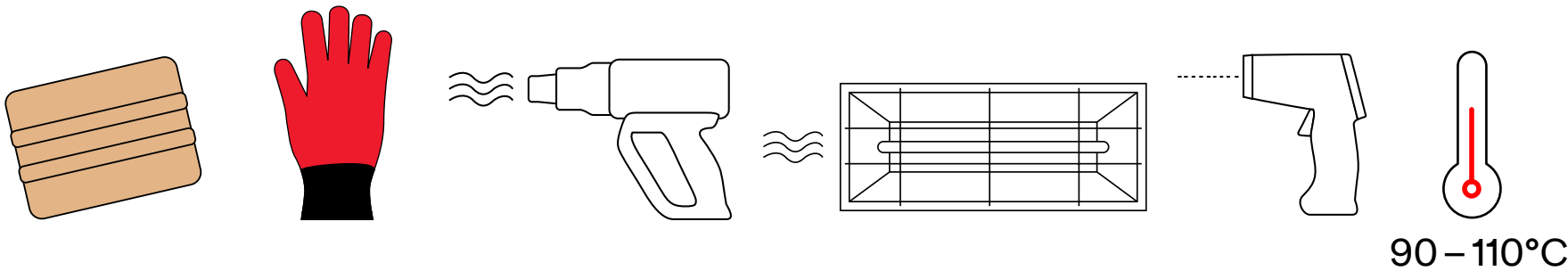
90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges and seams.

⚠ **Use IR heater on full graphic.**
Temperature Range 90 – 110°C (194–230°F)

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Decal — Center Hinge Method
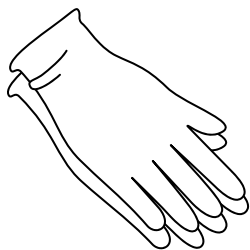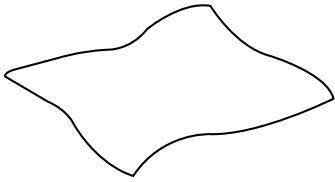
Decal — Center Hinge Method

Prep surface

Prep the area by cleaning the film surface where the decal will be placed to ensure proper adhesion to the bottom layer of film.

Position and tape

Position the decal and use masking tape to temporarily secure it in place.

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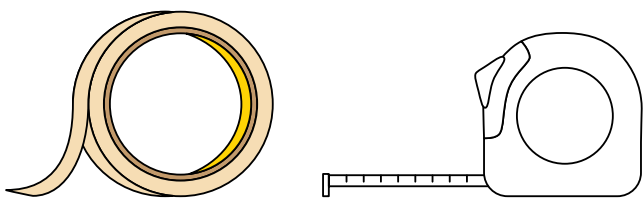
Center top hinge

Put a center hinge across the decal.

⚠ Once the hinge is applied, ensuring the decal is in place, cutting the decal between various elements — up to but not including the hinge — can help to make the decal more manageable.
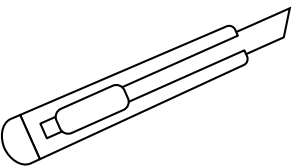
Remove liner

Peel the liner back from the decal and remove or cut the liner. Make sure to pull the liner from the graphic. Be careful to not peel the film away from the application tape.
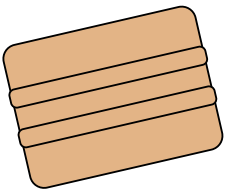
Apply decal

Confirm the position of the decal and apply the decal with a squeegee, using firm overlapping strokes.

Remove application tape

Once the decal has been applied, remove the application tape. Starting at a corner, pull the tape back on itself at about a 180 degree angle. Pull evenly and smoothly to prevent lifting the decal from the surface.

Decal — Center Hinge Method

90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges and seams.

⚠ **Use IR heater on full graphic.**
   Temperature Range 90– 110°C (194–230°F)

Using 3M™ Knifeless Tape

Prep surface

Prep the substrate as required including cleaning, fixing any damaged areas, cleaning again and using an adhesion promoter on all corners and edges where applicable.
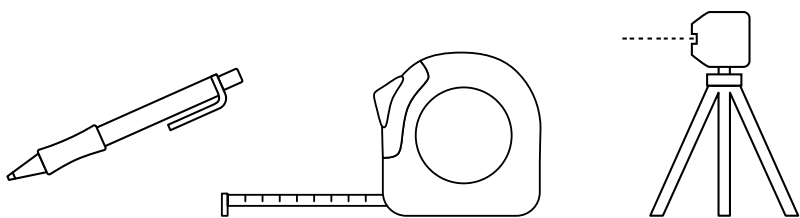
Mark location

Use a pen or laser level to mark the location for the Knifeless tape. This will become the top edge of the underlying graphic.
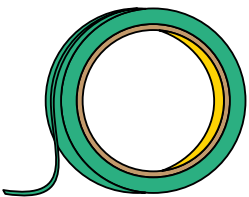
Apply Line 1

Apply Line 1 in a straight line as marked on the body of the rail car. This line will be used to cut the top of Panel 1.

> ⚠ When creating horizontal overlaps, always apply the bottom graphic first and work upwards. This will ensure that the above film overlaps the bottom film. This will help prevent edge lift and moisture from collecting on the seam.

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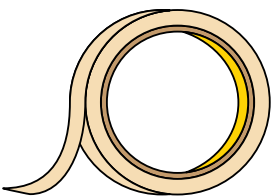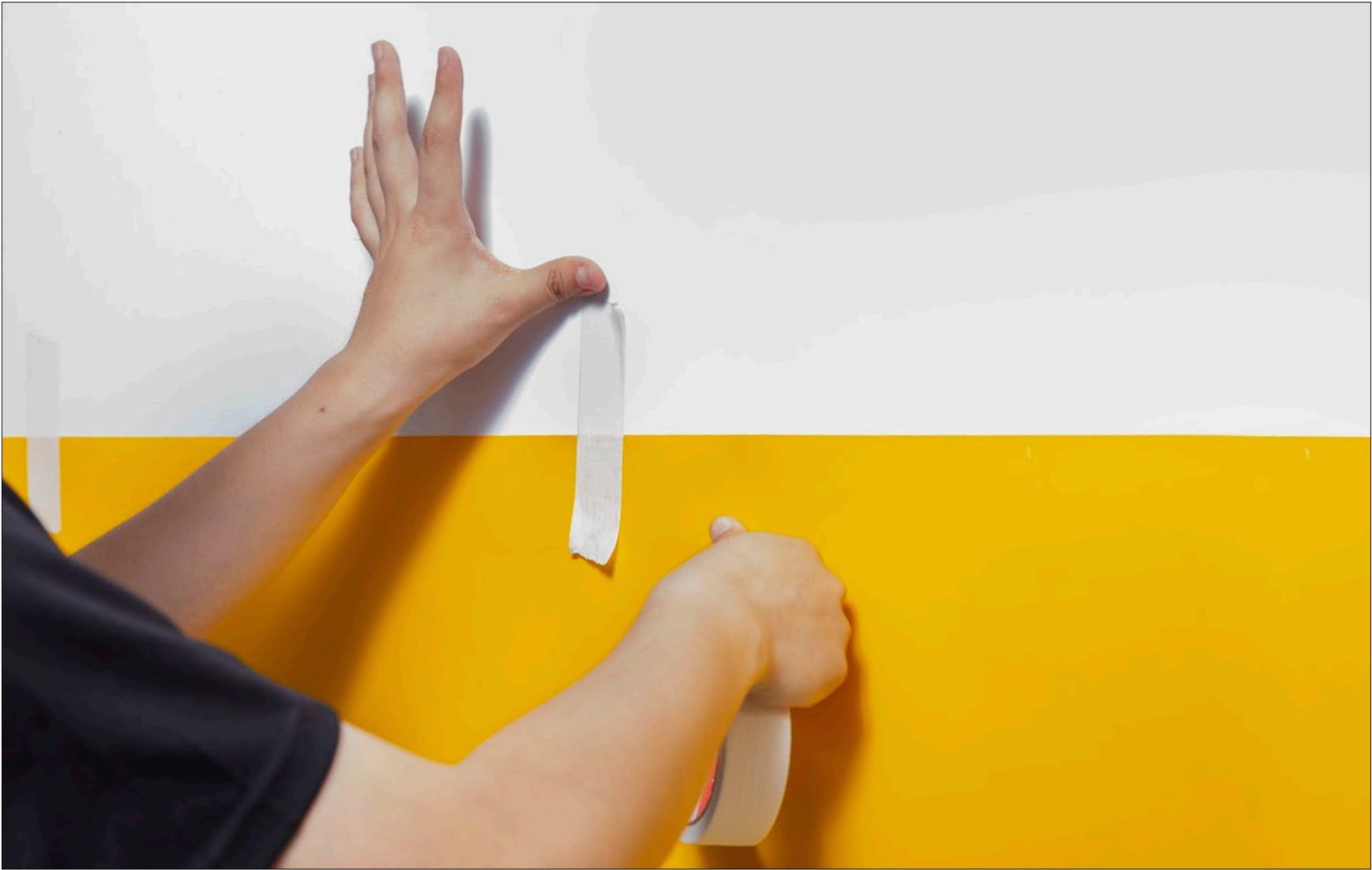
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Position Panel 1

Using masking tape, align the unapplied graphic Panel 1 on the substrate so there is excess material above Line 1.

> ⚠ **This will allow the installer to make a clean cut with 3M Knifeless Tape.**

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Using 3M™ Knifeless Tape
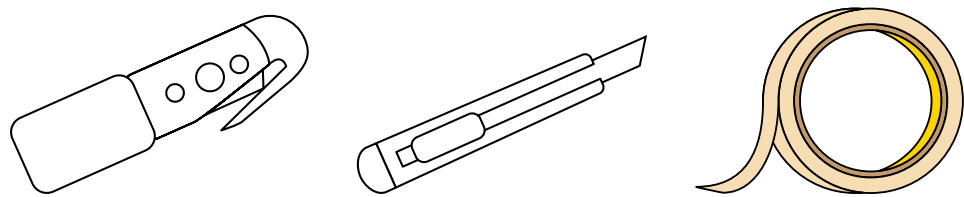
Remove Panel 1 liner

Using the hinge method, peel the liner away from the film. Cut the liner with a liner cutter or a knife.

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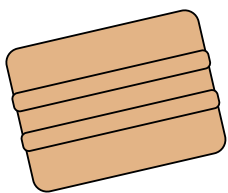
Apply Panel 1

Apply Panel 1 with a squeegee, using firm overlapping strokes. Starting approximately 2.5 cm (1") from where the liner was cut and in the center of the graphic, apply the film outward to both edges.

> ⓘ Remember to emphasize the 2 o'clock and 10 o'clock position of the squeegee. If the squeegee is completely vertical, you WILL get bubbles and wrinkles.

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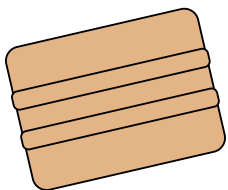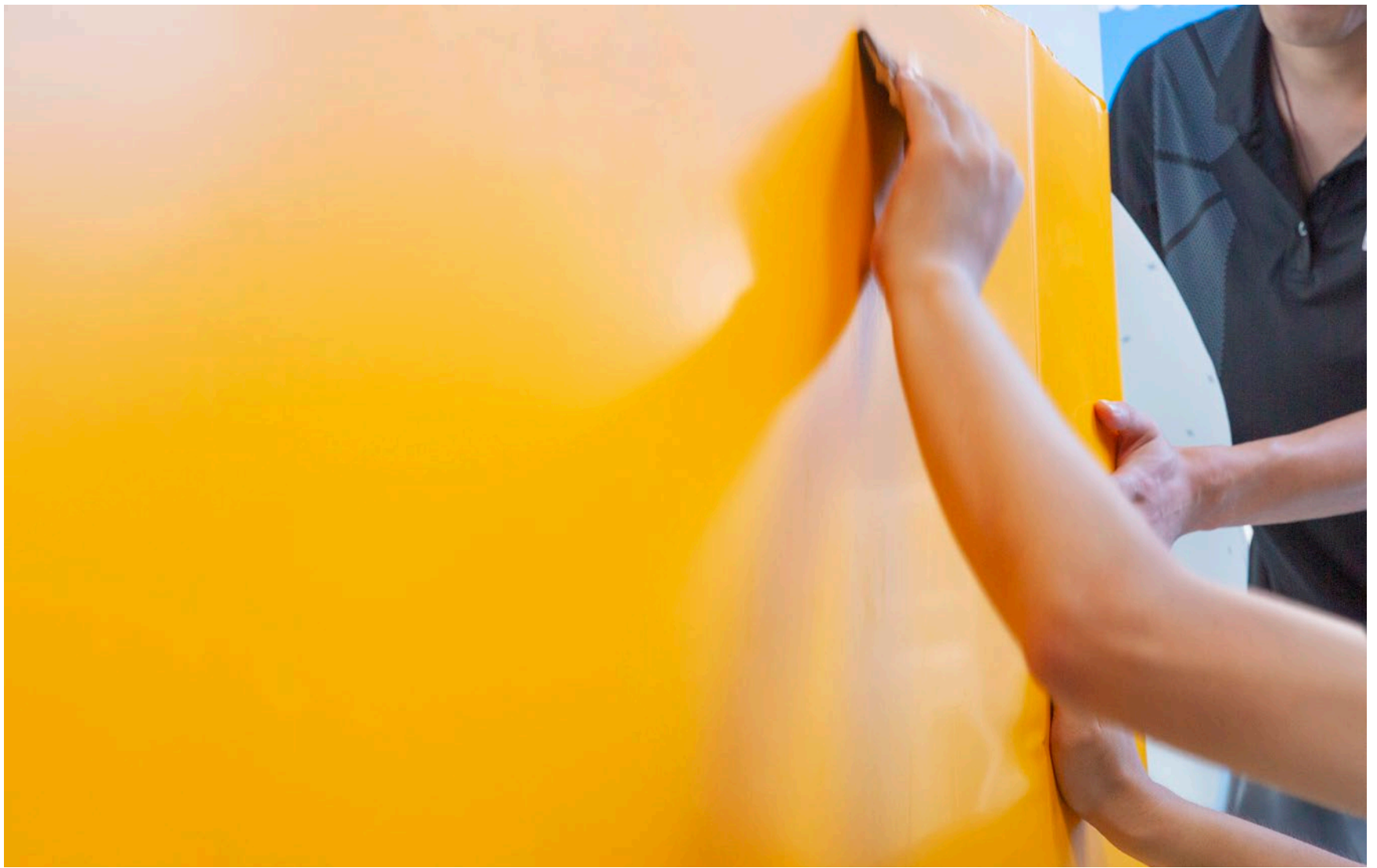
Apply Panel 1

Lift up the graphic from the side that has not been squeegeed and peel the liner back 20–30cm (8–12"). Apply the film with a squeegee, using firm overlapping strokes.
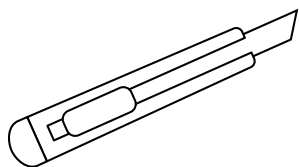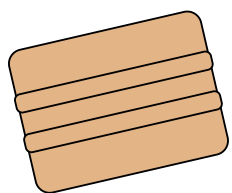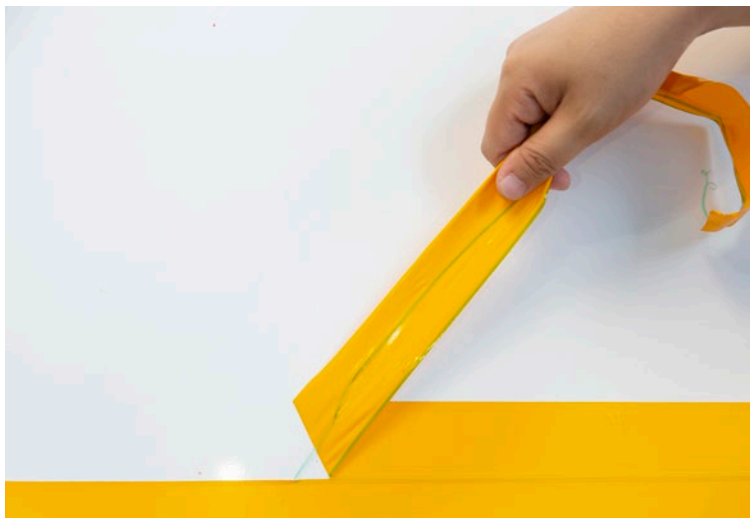
Trim Panel 1

Pull Line 1 to cut the panel across the top. Use a knife to trim the excess material on the other sides of the panel. Re-squeegee the edges.
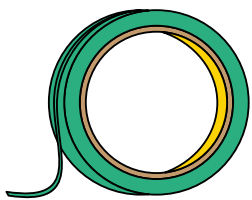
Apply Line 2

Clean overlap area, then apply Line 2 and film. Apply tape parallel to the top edge of the graphic allowing for a 6-13 mm overlap. This will create the overlap for Panel 2 that is approximately 6mm (¼") thick.

> ⓘ A 6–13mm (¼–½") overlap is recommended. Do not make the overlap any smaller. If a larger overlap is required, position the Knifeless tape further down onto Panel 1.
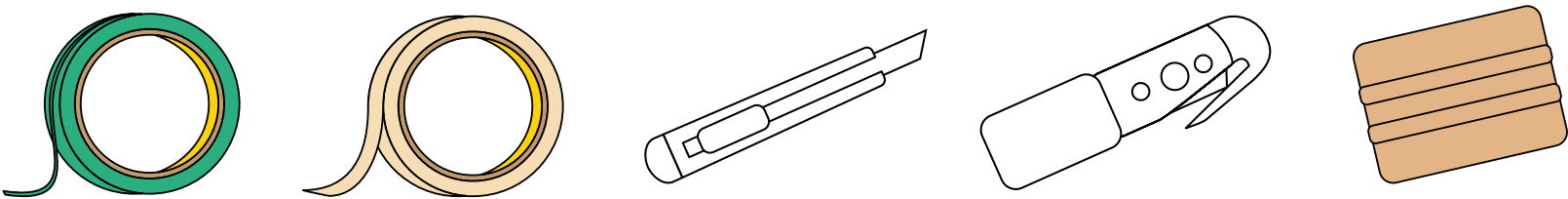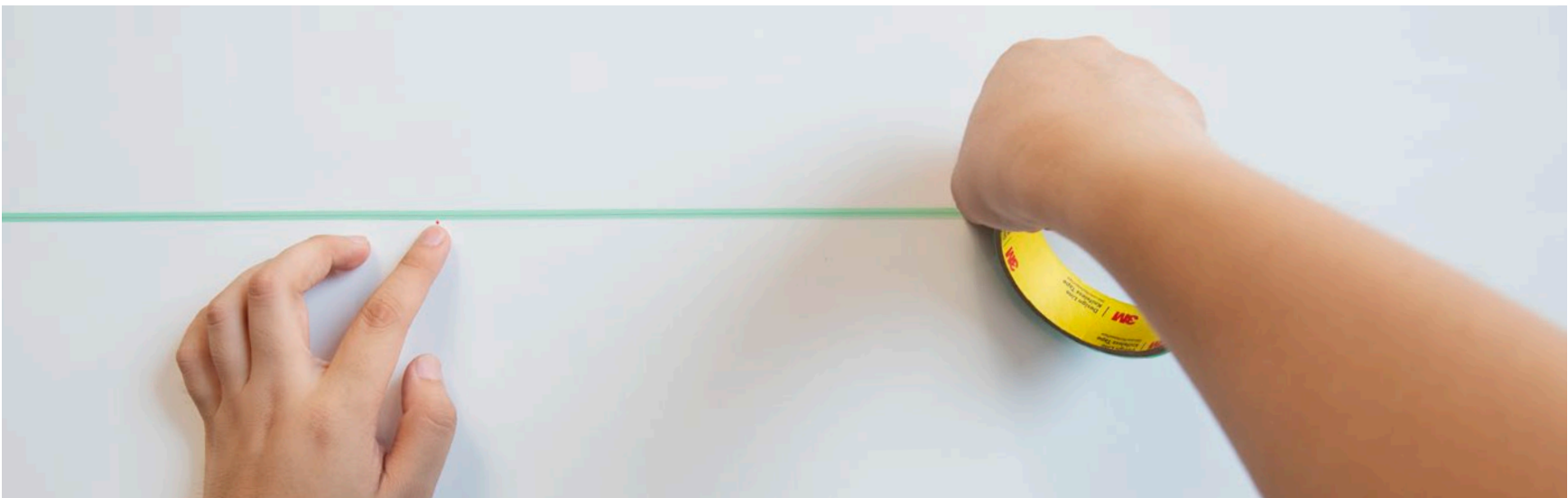
Apply Panel 2

Repeat steps used to apply Panel 1 for installation of Panel 2.

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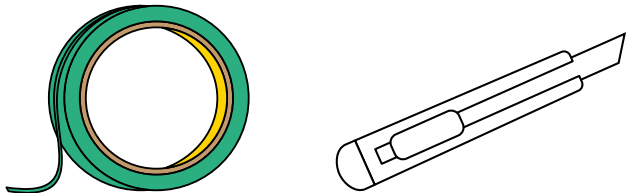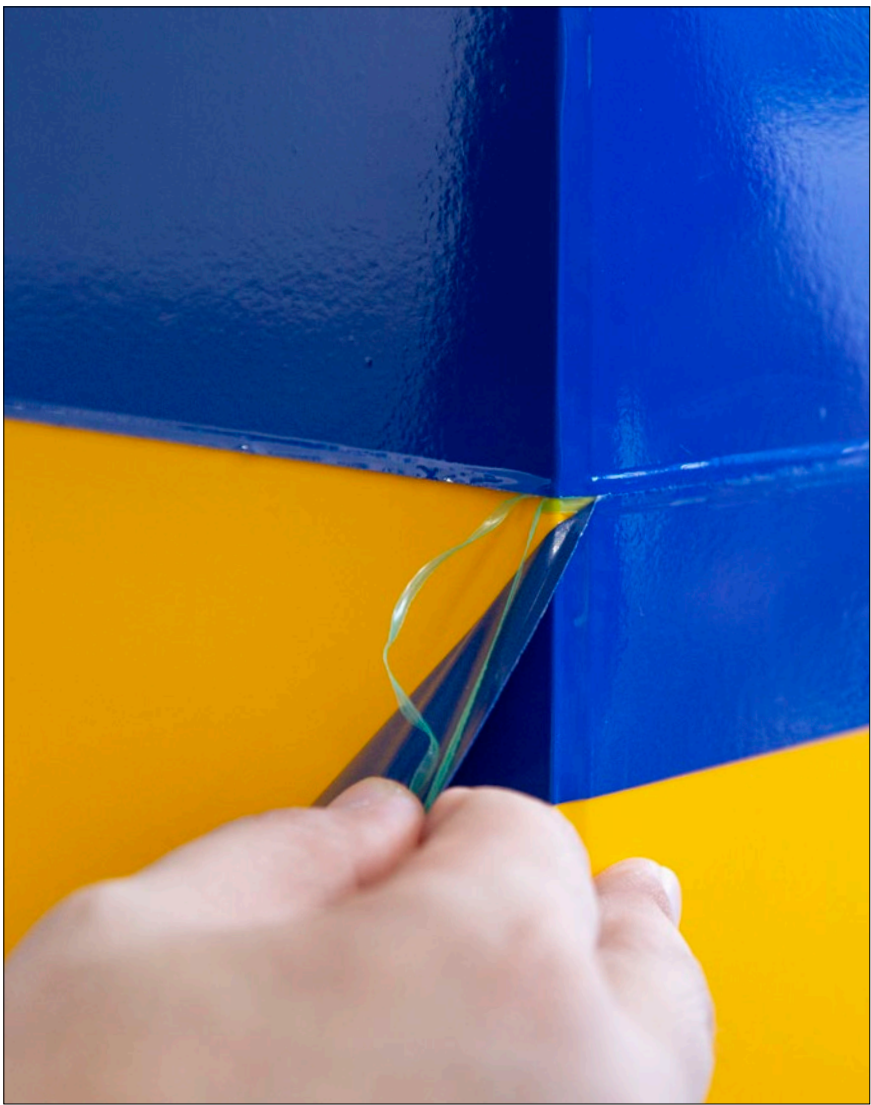
Trim Panel 2

Pull the Line 2 to create the overlap seam between panel 1 and panel 2. Resqueegee all edges.

Creating an Overlap
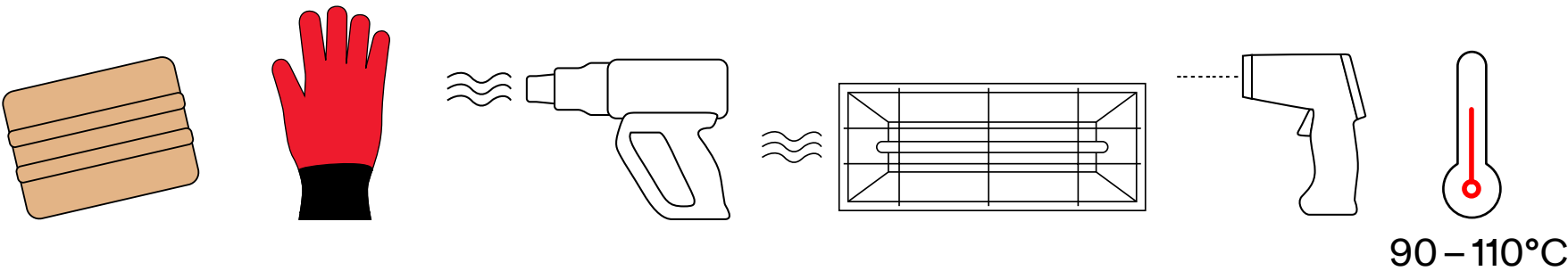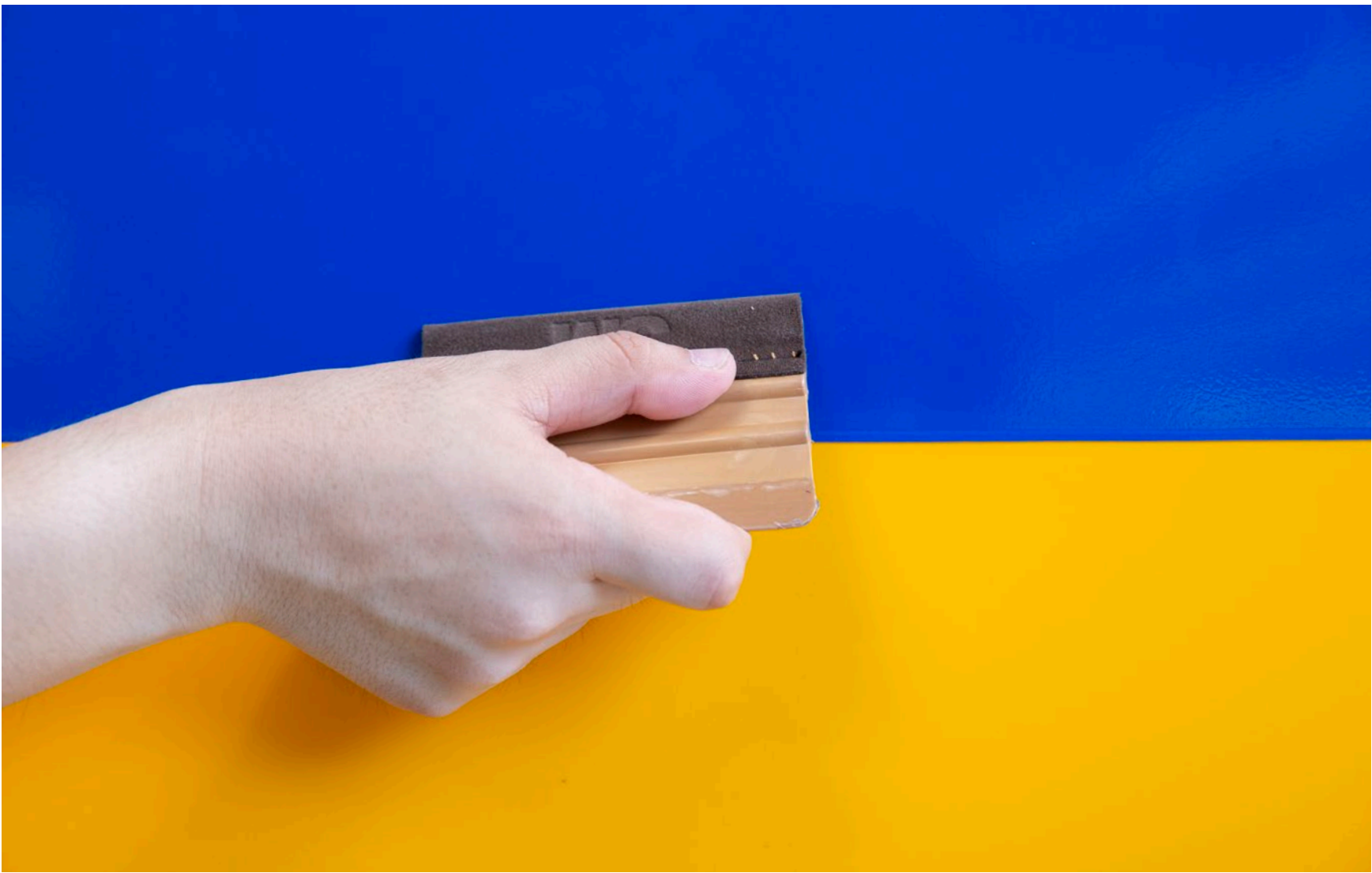
90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges and seams.

⚠ **Use IR heater on full graphic.**
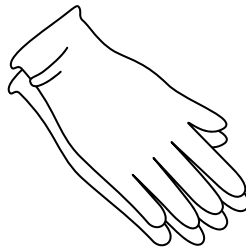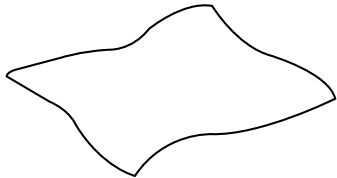**Temperature Range 90 – 110°C** (194–230°F)

Headlight
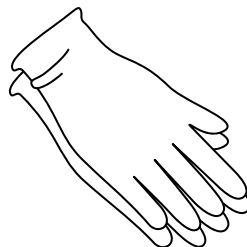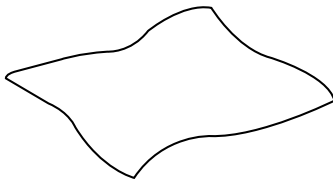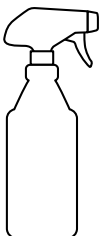
Prep headlight recess area

Prep the substrate as required including cleaning, fixing any damaged areas, cleaning again. Apply a thin line of adhesion promoter to the window headlight recess. Let dry according to manufacturer's recommendations.
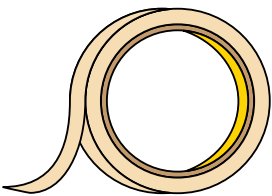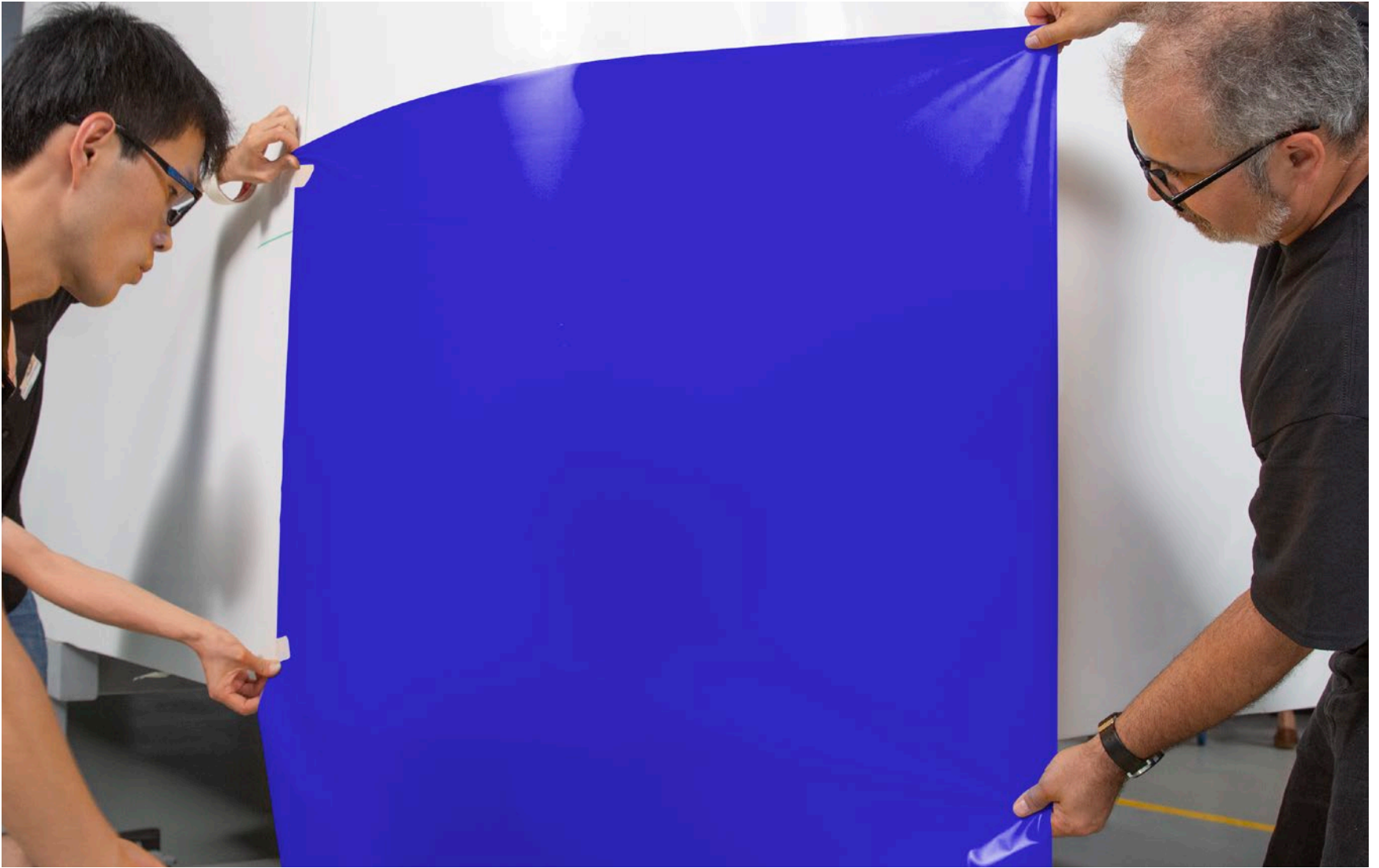
Position graphic film

Align the graphic panel over the headlight. Use masking tape to secure into place.

> (!) A conformable base film is required for this application. Reach out to your local representative for questions about product recommendations.
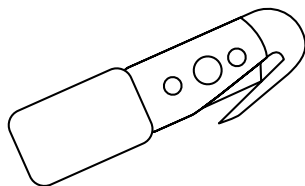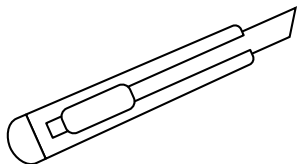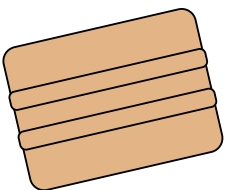
Apply film

Peel the liner back from the graphic panel. Cut liner and remove. Apply the film with a squeegee using firm overlapping strokes. Film will cover headlight recess area.
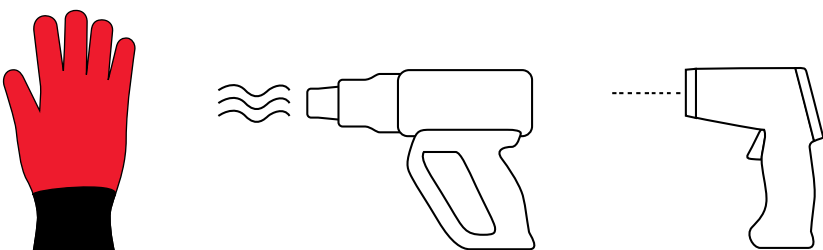
Conform curves

Heat can be used to conform around the compound curves.

> ⓘ A conformable base film is required for this application. Reach out to your local representative for questions about product recommendations.
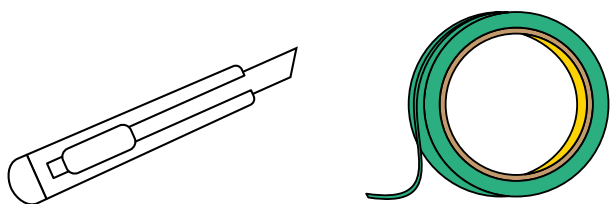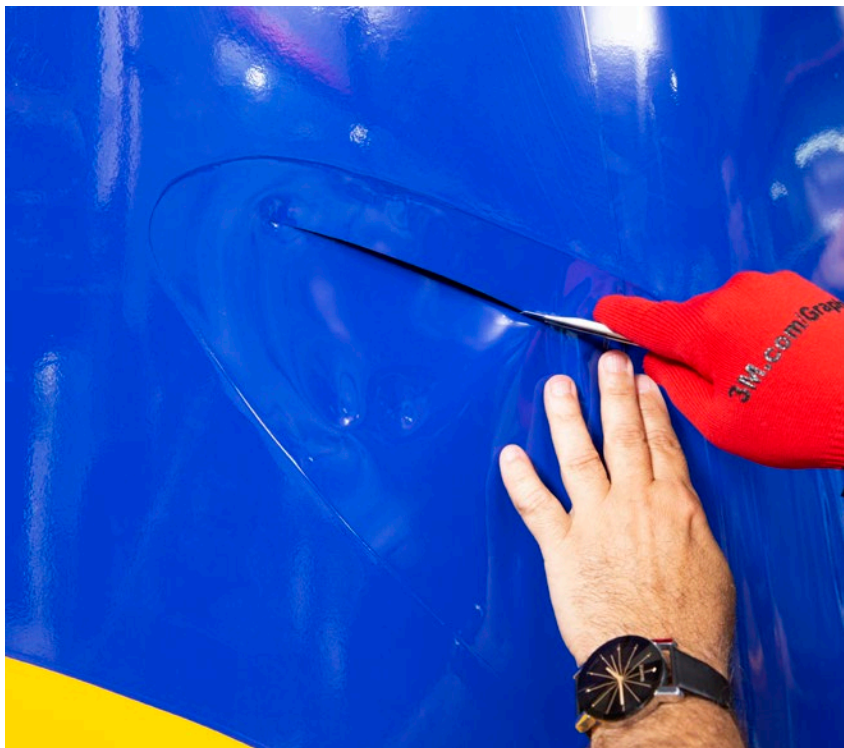
Remove film over headlight area

Once the graphic panel is applied over the headlight, use a knife, cut a hole approx. 5cm (2") from the edge of the headlight recess.

(!) **If the headlight cannot be removed, apply the film as deep as possible between the headlight and the car body.**

(!) **3M Knifeless Tape can be used to make the cut around the headlight. Apply the tape before applying the film for this process. Position the tape on the edge of the headlight. Leave 15cm (6") tail of tape within the headlight area for puling the filament to cut the film.**
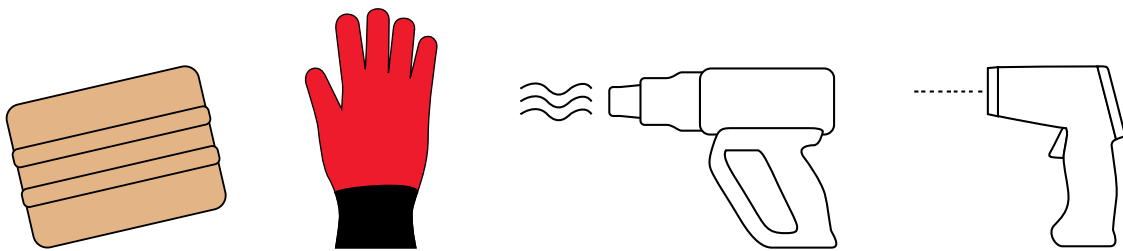
Conform film into recess

Using heat, gently conform the material into the recess. Apply the film up to the inner recess.

> ⊘ **If there is a plastic molding around the headlight, cut the film back 6mm (¼") from the molding following a similar process to the windows.**
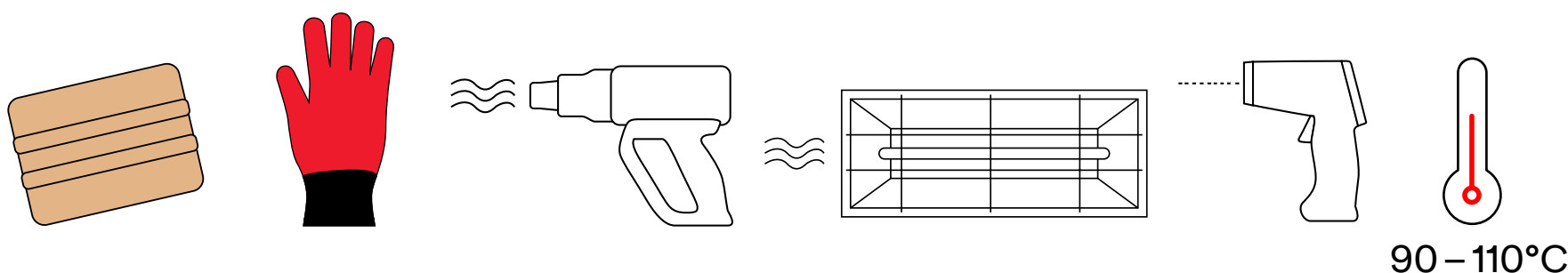
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90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges and seams.

ⓘ **Use IR heater on full graphic.**
Temperature Range 90 – 110°C (194–230°F)

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Door Frame

1

Door Frame
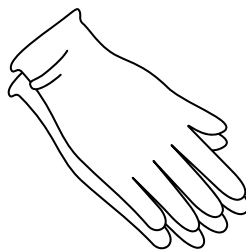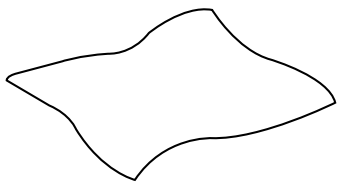
Prep surface

Prep the substrate as required including cleaning, fixing any damaged areas, cleaning again and using an adhesion promoter on all corners and edges where applicable.

⚠ **Application method only for conformable combinations of films, please ask to 3M Technical Department for recommendation on each specific application**
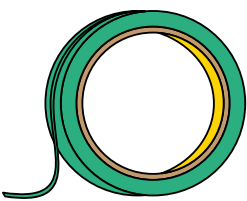
Apply Line 1

Apply Line 1 in a straight line on the inside surface of the door opening. (The location of the tape replicates a deep door opening.)

> ⚠ For rail cars with recessed doors, 3M Knifeless Tape would be positioned where the doors meet the edge of the surface opening ensuring the graphic will be completely wrapped.
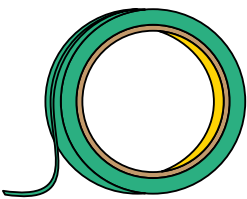
Apply Line 2

Clean surface, then apply Line 2 to create a second straight line on the inside surface of the door opening 13mm (½") from the outer edge.

3M Adhesion Promoter

Dry Time

Apply adhesion promoter

Apply an adhesion promotor to the edge of the door opening. Allow adhesion promotor to dry per manufacturer's instructions. Then apply Panel 1.

⚠ **Contact your local 3M representative to discuss where adhesion promoters should be used.**
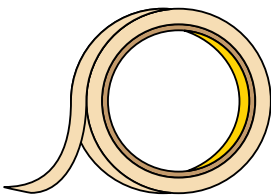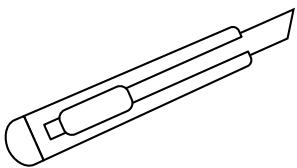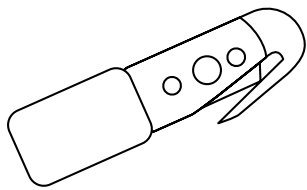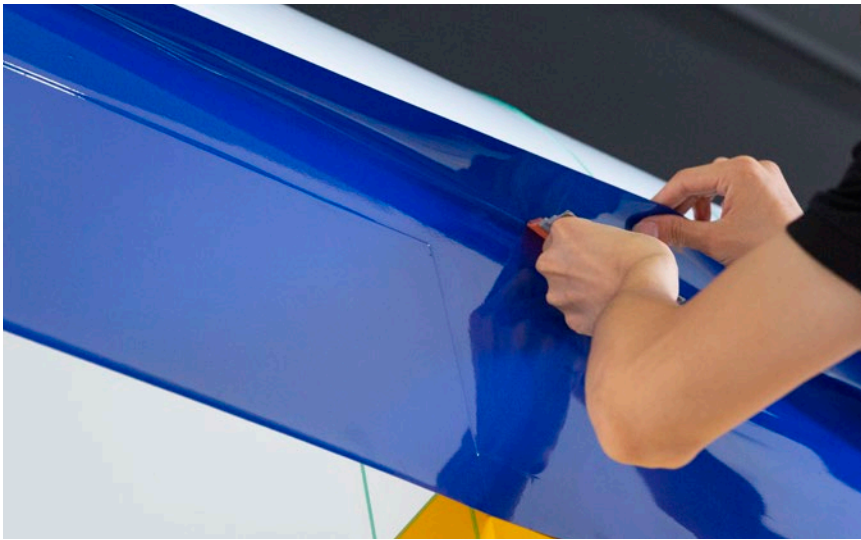
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Position Panel 1

Using the vertical hinge method, peel away the liner from the graphic. Use a liner cutter or knife to cut the liner. Position the graphic to ensure there is enough material to be applied beyond line 2.
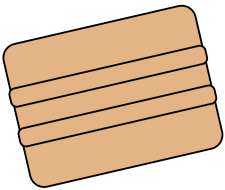
Apply Panel 1

Using firm overlapping strokes, apply Panel 1 to the flat surfaces with a squeegee.
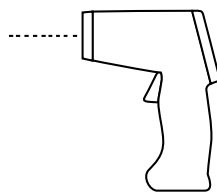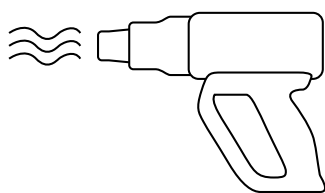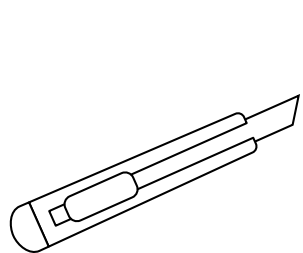
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Conform to edges

Using heat, conform the film around the leading edge of the door frame past the Knifeless tape.

> ⚠ **A knife can be used to make a 45 degree cut from the corners towards the middle to relief the film.**
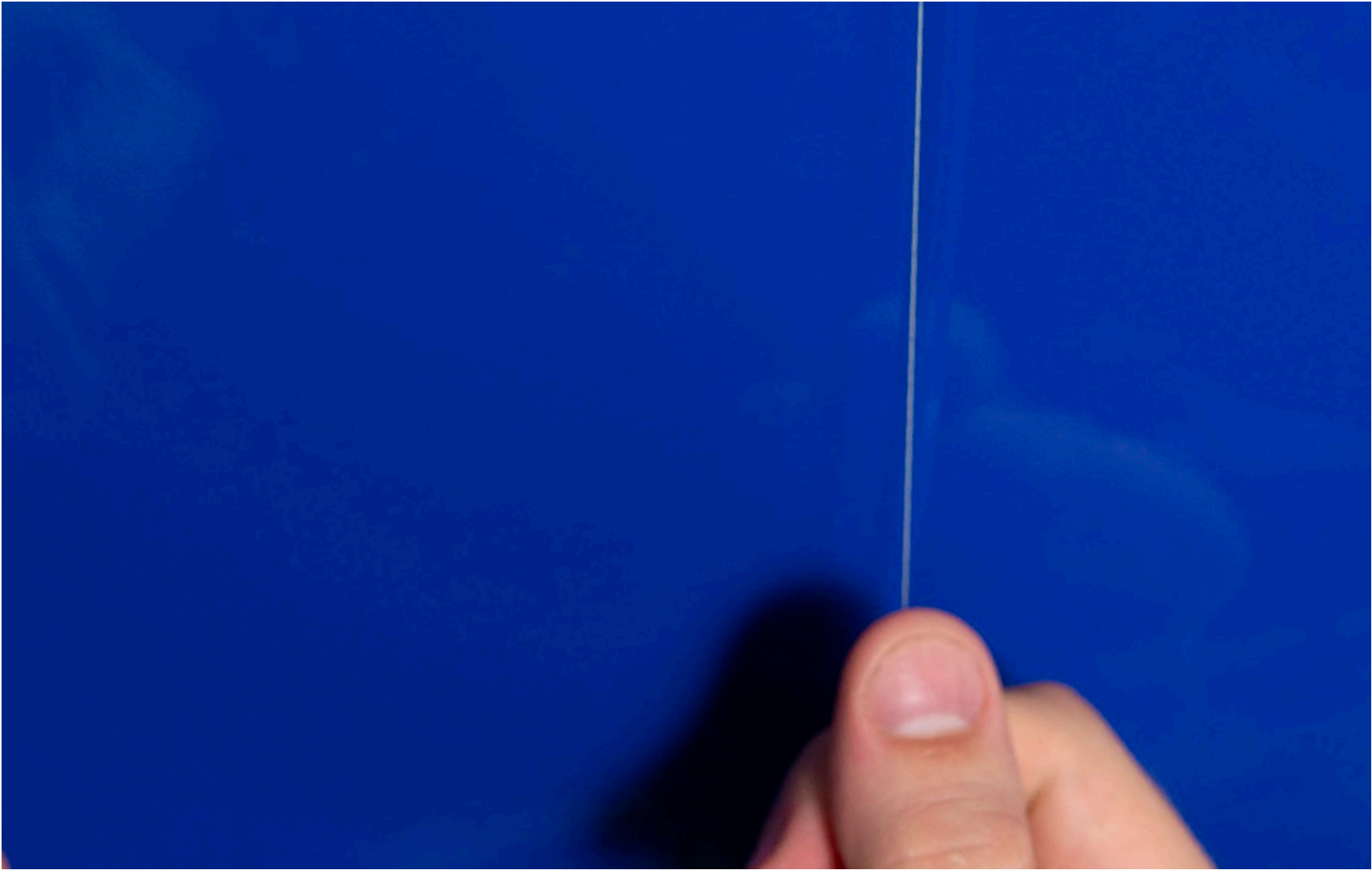
Door Frame

Trim Panel 1

Once the film is applied past Line 2, pull Line 2 to trim panel 1.

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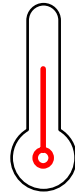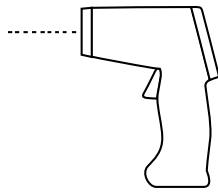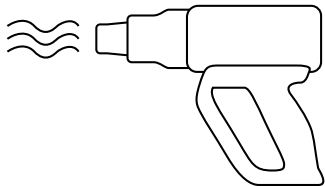
Post heat

Once the cuts are made, post heat this area to 90–110°C (194–230°F). This step is required for all areas that are stretched.

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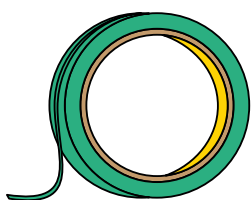
Apply Line 3

Clean surface, then apply Line 3 on the leading edge of the film that was just conformed. At a minimum, the edge of the tape should be flush to the edge of the film. Line 3 will be used to create the overlap with the inlay.

ⓘ **A 6–13mm (¼–½") overlap is recommended.**
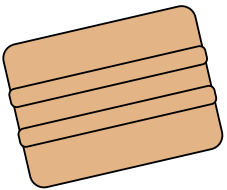
Apply film inlay

For the inlay, use a piece of film that matches the color of the panel. This film needs to be larger than the dimensions of the Knifeless tape.

Apply the inlay material with a squeegee using firm overlapping strokes.

Trim film inlay

Once the inlay is applied, pull Lines 3 and 1 to cut the film. Remove excess film and Knifeless tape.

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Door Frame
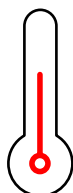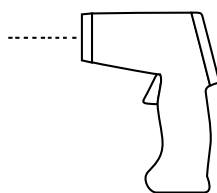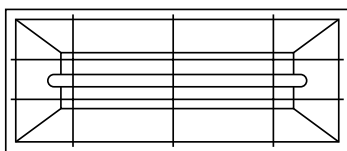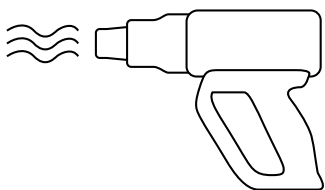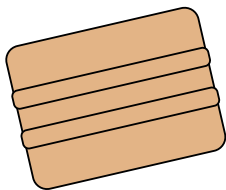
90 – 110°C

Finish application

To finish the installation, re-squeegee and post heat all edges.

> ⊙ **Use IR heater on full graphic.**
> **Temperature Range 90– 110°C** (194–230°F)

Graphic
Repair

Graphic Repair
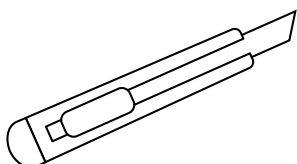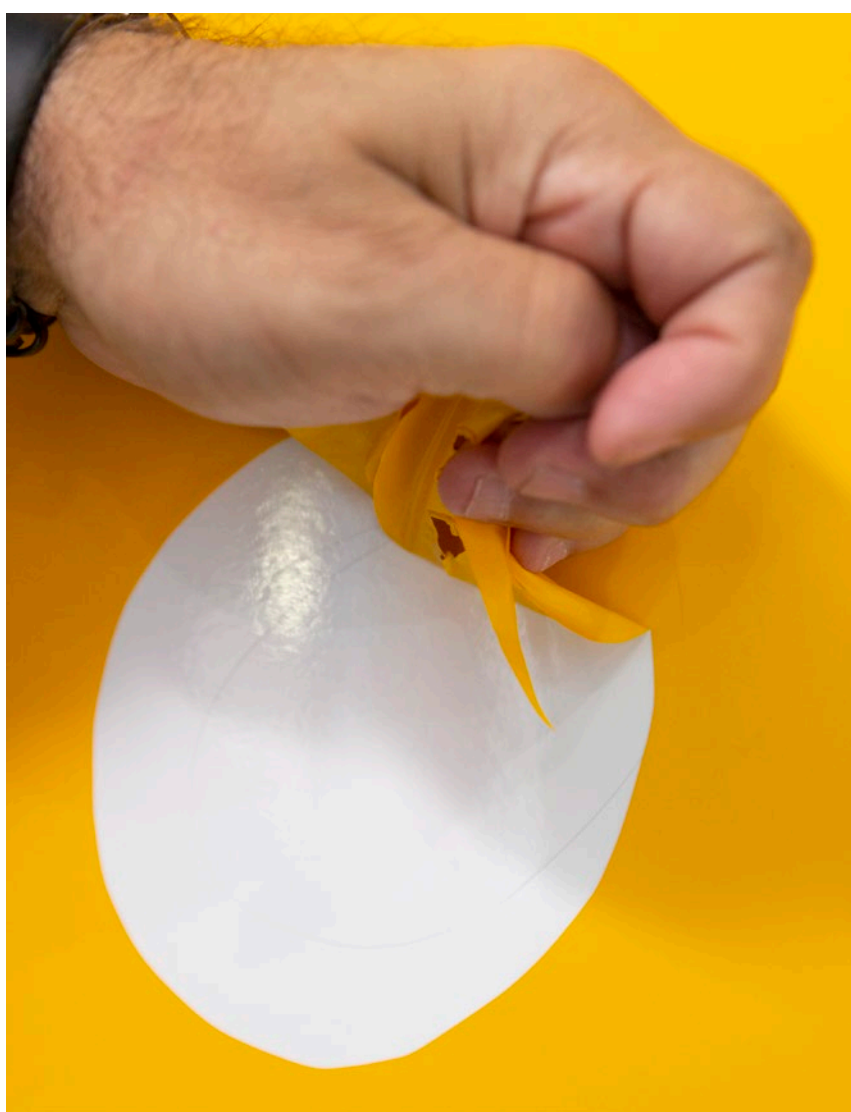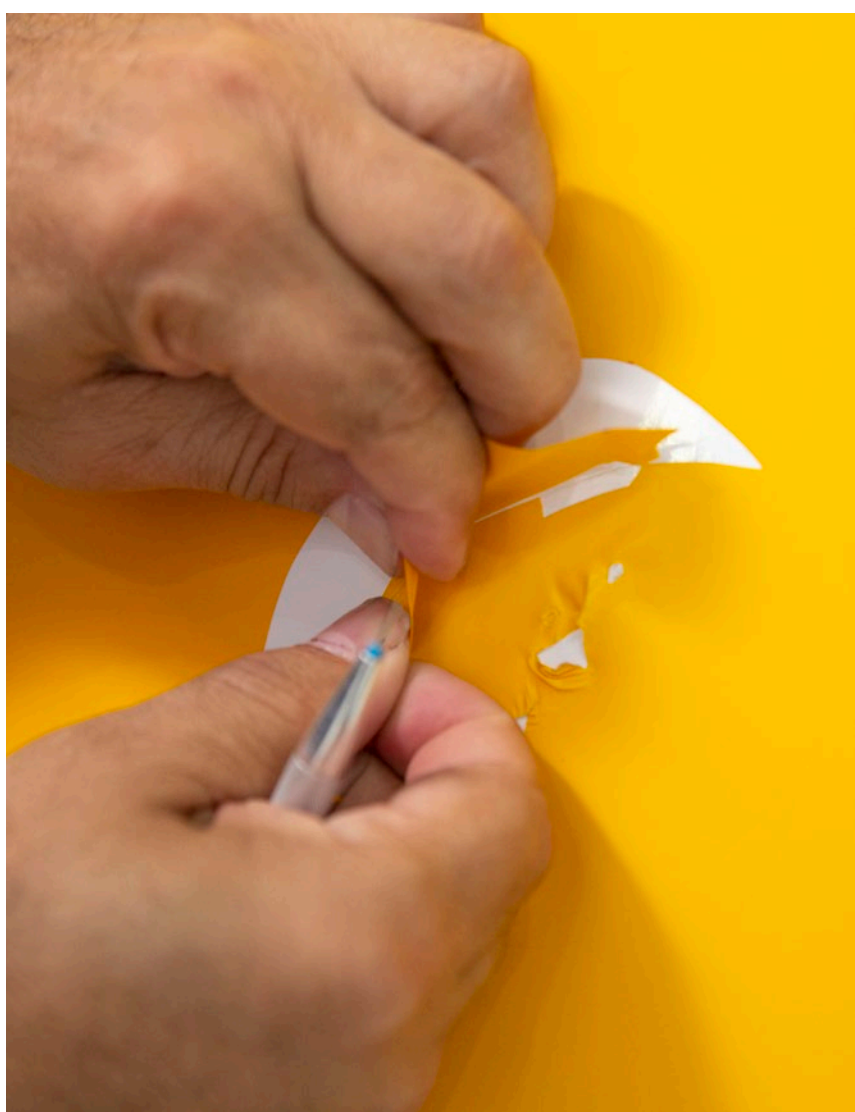
Remove damaged film

Cut out the damaged area of the film in a circular shape. Do not cut into the surface.

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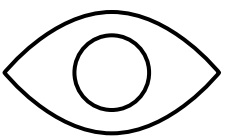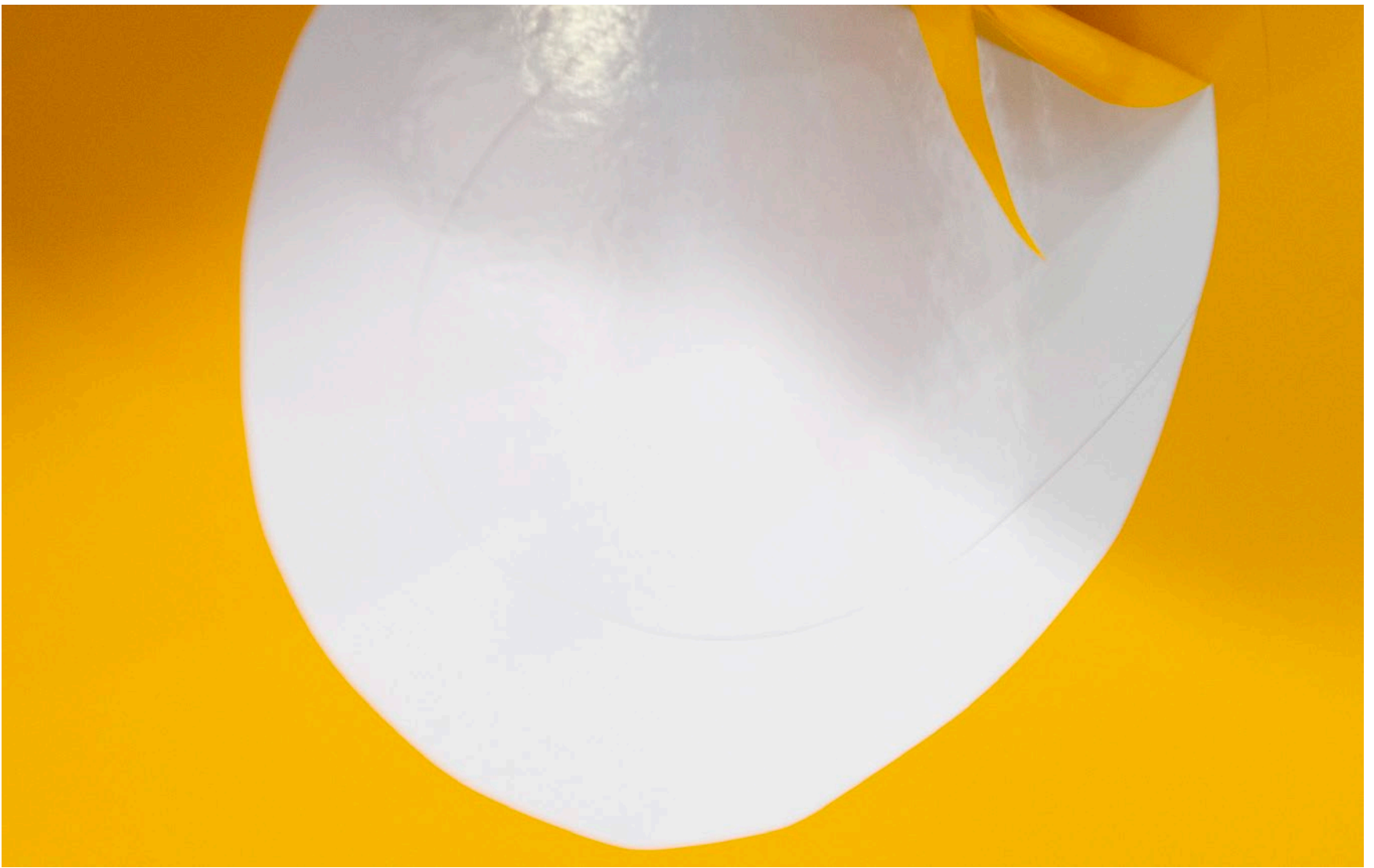
Check substrate under damaged area

Inspect the integrity of the surface. Prep the substrate as required including cleaning, fixing any underlying damaged areas, and cleaning again.
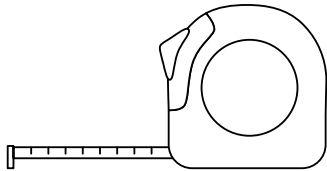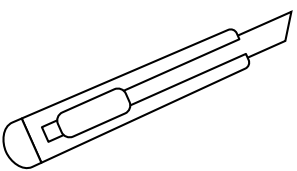
Prepare Graphic Patch

Use a color/pattern that will best match the area needing to be patched. Cut a piece of film larger than the template.
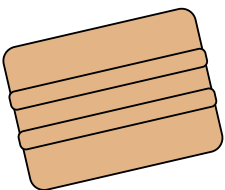
Position Graphic Patch

Remove liner from patch. Position over damaged area — making sure to line up the pattern if applicable. With a squeegee, **lightly** adhere the patch over the damaged area.
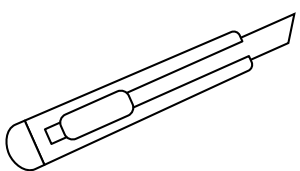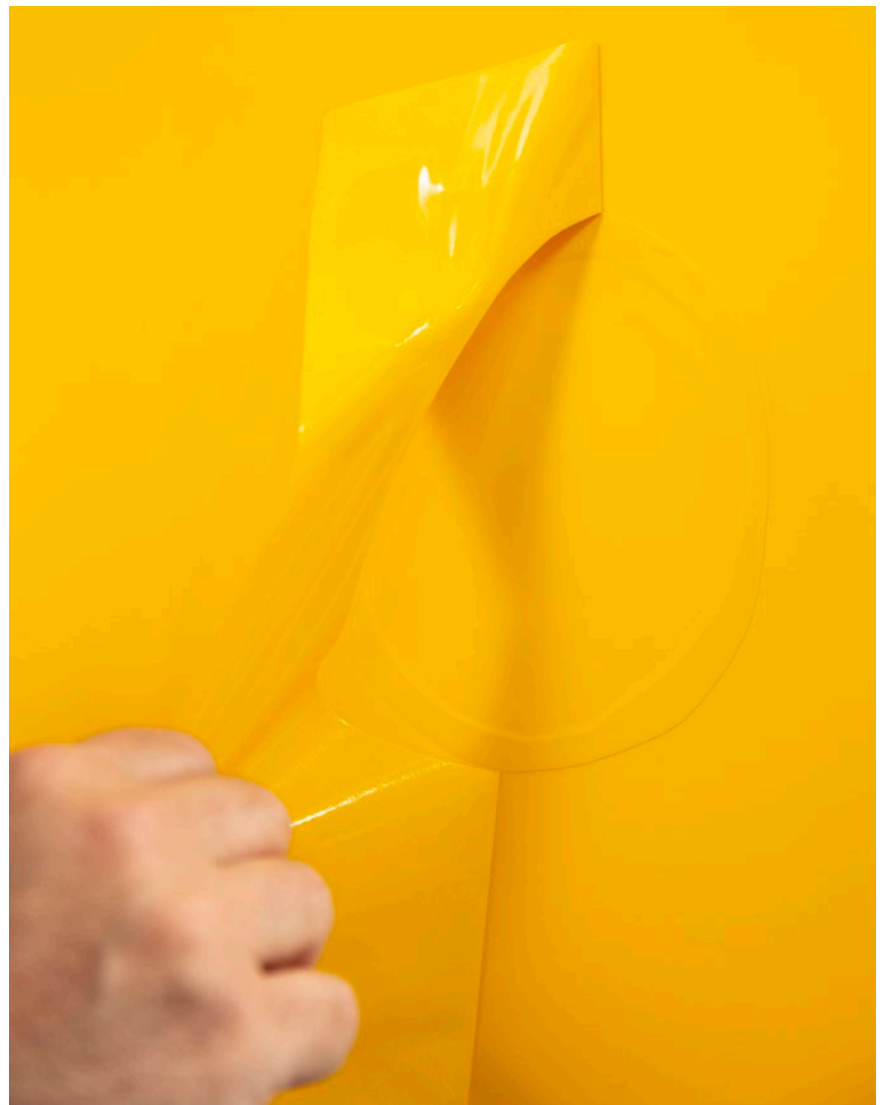
Cut shape

Cut a circular shape out of the two layers of film about 3 – 6mm (⅛ – ¼") larger than the area cut in Step 1. Be sure to keep the blade perpendicular at all times. Peel away excess patch material.

⚠ Refer to template from step one to help with making the shape required.
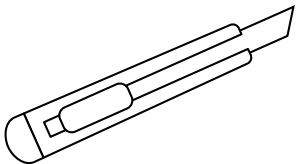
Remove excess film under patch

Peel the patch back about halfway. While holding down the repair patch, remove the small excess strip of film from the graphic below.

> ⚠ **Do NOT remove the entire patch from the surface, at this point it is in the perfect position.**

Create tight seam

Lay the middle section of the patch down about 6−13mm (¼−½") from the edges.

Start at the tips/corners with your fingernail and drop the edges down in line with the edge below creating a tight flat seam. Work the remaining material by pushing towards the center of the patch. **Do not overlap the seams.**
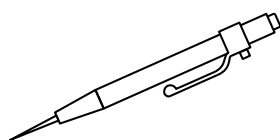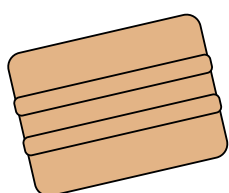
Remove air bubbles

Once all the edges are down, squeegee out any excess air bubbles in the center of the patch. Use an air release tool to poke a hole to release any trapped air.

Graphic Repair
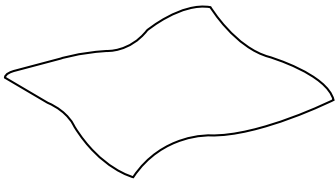
Clean repair area

Wipe down the surface with isopropyl alcohol to remove any fingerprints, smudges, etc.

Edge Sealing

Prepare the graphic

Re-squeegee the edges before applying edge sealer.

Make sure all edges are clean, dry and free of contaminants.

Prepare edge sealing tape

Peel the liner back from the edge sealing tape approximately 20mm (.79").

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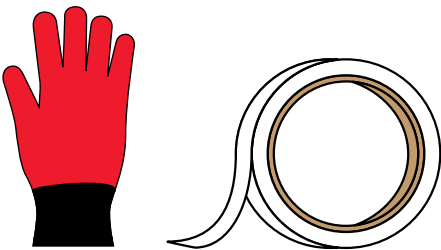
Apply edge sealing tape

Using a wrap glove, press the exposed adhesive of the edge tape over the seam/overlap. Make sure that the seam/overlap is in the middle of the tape.

Using firm, even pressure, apply the tape to the seam, pulling the liner as the tape is applied. Cover all exposed seams that require edge sealing with the tape.

⊘ **The width of the edge sealing tape is approx. 13mm (½"). This will leave an approx. 6mm (¼") of tape on both sides of the seam.**
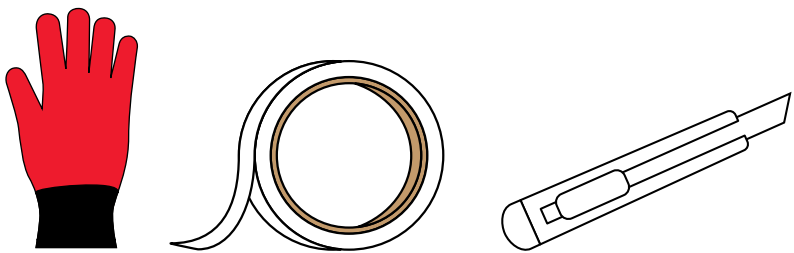
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Trim edge sealing tape

Use a knife to cut the edge tape. This will ensure a clean edge.

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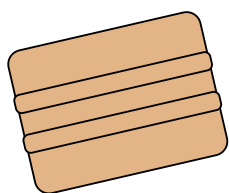
Edge Sealing — Tape

Finish application

Re-squeegee all the edge sealing tape.

3M recommends liquid 3M™ Edge Sealer 3950, 4150S, ES2000, or 3M™ Edge Sealer Tape 8914 for the graphics needing edge protection.

(!) **For more information about edge sealing recommendations, see Instruction Bulletin 5.45.**

Edge Sealing — Knifeless Tape Method
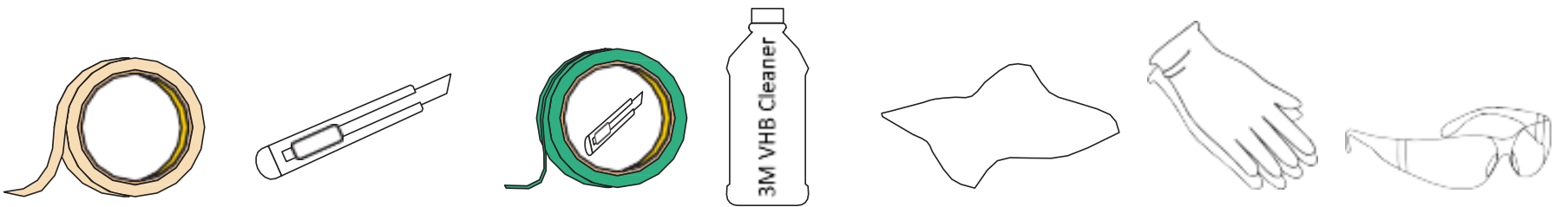
Prepare the surface

Apply Tri-Line Knifeless Tape along the seam or but Joint, (Choose appropriate "Width" by selecting the lines to pull.)

Prepare the surface again- clean the tape surface (VHB Cleaner).
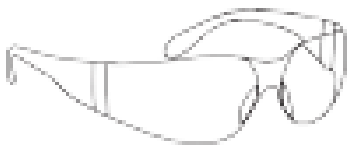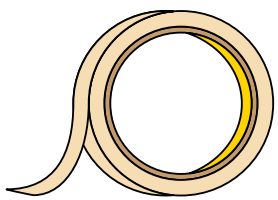
Apply masking tape

Use masking tape overlapping/ exceeding the area you want to seal.

Apply masking tape firmly and insure you see the lines contour clearly- pull the two lines to open the area

Apply edge sealer

Re- Apply masking tape firmly and insure 100% Surface contact

Prepare the surface again- clean the sealing area/surface (VHB Cleaner).

Apply the liquid with brush, felt tip or Scotchweld Pistol (3950, Es 2000). Evenly distribute as needed

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Remove masking tape

Remove Masking tape prior to the full curing of the liquid. Make sure there is a flow out (shoulder) build and not a firm rectangular edge.

Eventually use heat to enhance, promote the curing of the Sealer.

Edge Sealing — Application Tool

Prepare the graphic

Re-squeegee the edges before applying edge sealer.

Make sure all edges are clean, dry and free of contaminants.

Mask off application area

Apply masking tape strips on each side of the seam. The inside edge of the masking tape stripes should be approximately 6mm (¼") from the seam.

> ⊙ This process will ensure straight edges for where edge sealant is applied. Without this tape process, the edges of the edge sealant may not be straight.

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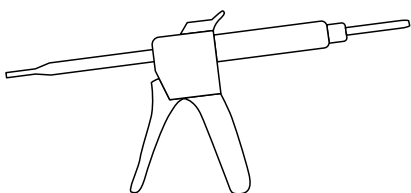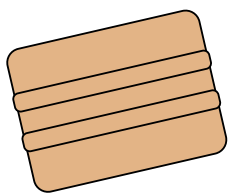
Apply edge sealer

Using the 3M™ Scotch-Weld™ Applicator, apply a bead of 3M™ Edge Sealer ES2000 on the seam between the two lines of masking tape.

Once the bead of ES2000 edge sealer has been applied to the seam, drag a squeegee across the bead of edge sealer to smooth out the bead into a uniform thickness that covers the gap created by the two stripes of masking tape.

Edge Sealing—Application Tool
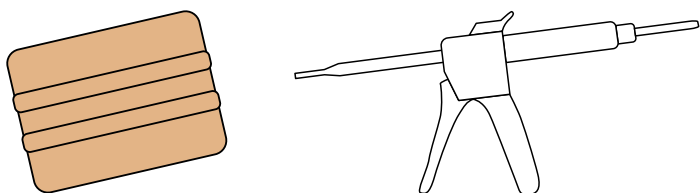
Touch-up bare spots

If bare spots appear during application, reapply edge sealant using the 3M™ ScotchWeld™ Applicator. Use a squeegee to ensure a uniform thickness and coating on that area.

> ⓘ **Make sure there is an even coating of edge sealer along the seam. There should not be any drips or voids along the sealed edge.**

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5–10 min.

Remove masking tape

Remove the masking tape approximately 5–10 minutes after applying the edge sealant.

> ⓘ Drying time of the edge sealant may vary dependent on the environmental conditions in which it was applied. Make sure when removing that the edge sealant is still moist but not dripping for best results.

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Air dry

Let the edge sealant air dry for 24 hours in a clean environment before putting the graphic into service.

⚠ **The edge sealant may be tacky while drying. If the environment is dirty, dirt may stick to the edge causing a poor appearance.**
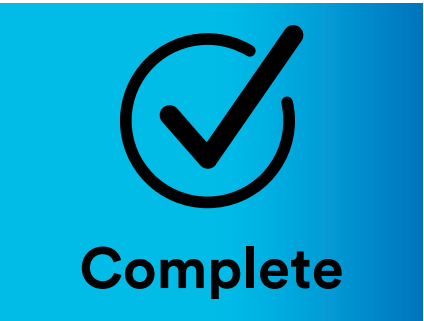
Edge Sealing Using Application Tool Installation completed

3M recommends liquid 3M™ Edge Sealer 3950, 4150S, ES2000, or 3M™ Edge Sealer Tape 8914 for the graphics needing edge protection.

(!) **For more information about edge sealing recommendations, see Instruction Bulletin 5.45.**

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Edge Sealing—Brush
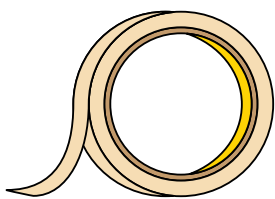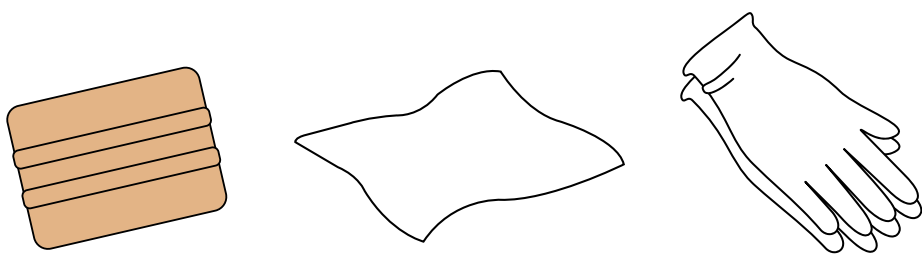
Prepare the graphic

Re-squeegee the edges before applying edge sealer.

Make sure all edges are clean, dry and free of contaminants.

Mask off application area

Apply masking tape strips on each side of the seam. The inside edge of the masking tape stripes should be approximately 6mm (¼") from the seam.

> ⊙ **This process will ensure straight edges for where edge sealant is applied. Without this tape process, the edges of the edge sealant may not be straight.**

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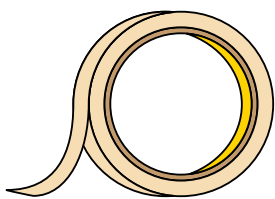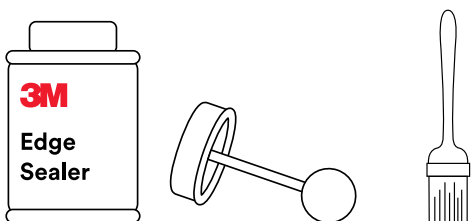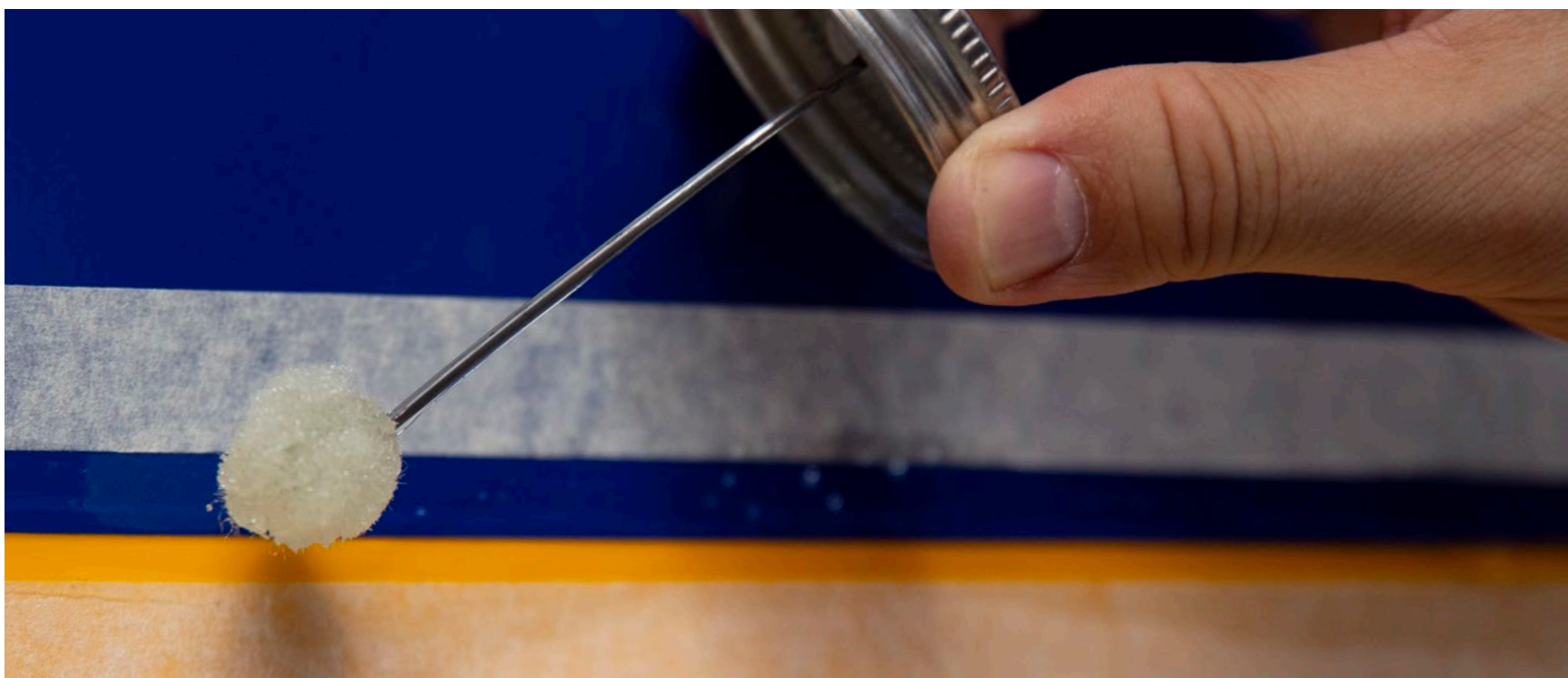
Apply edge sealer

Use the brush that is attached to the can top or a paint brush to apply the edge sealer to fully seal between the tape lines.

Dip the brush into the can. Wipe any excess edge sealer off the brush. Hold the brush or the flat edge of the dauber so the seam/overlap is half way between the applicator. Apply the edge sealer to the seam using consistent speed and pressure.

⊘ **A paint brush may provide a more uniform coating.**

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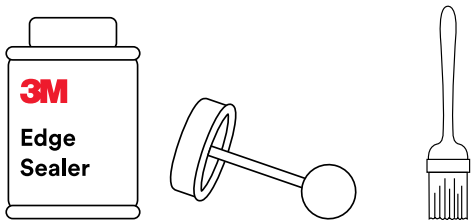
Touch-up bare spots

If bare spots of the edge sealer appear during application, apply more edge sealant to the brush and recoat this section.

> (!) **Make sure there is an even coating of edge sealer along the seam. There should not be any drips or voids along the sealed edge.**

5–10 min.

Remove masking tape

Remove the masking tape approximately 5–10 minutes after applying the edge sealant.

ⓘ **Drying time of the edge sealant may vary dependent on the environmental conditions in which it was applied. Make sure when removing the masking tape the edge sealant is still moist but not dripping for best results.**

Air dry

Let the edge sealant air dry for 24 hours in a clean environment before putting the graphic into service.

⚠ **The edge sealant may be tacky while drying. If the environment is dirty, dirt may stick to the edge causing a poor appearance.**
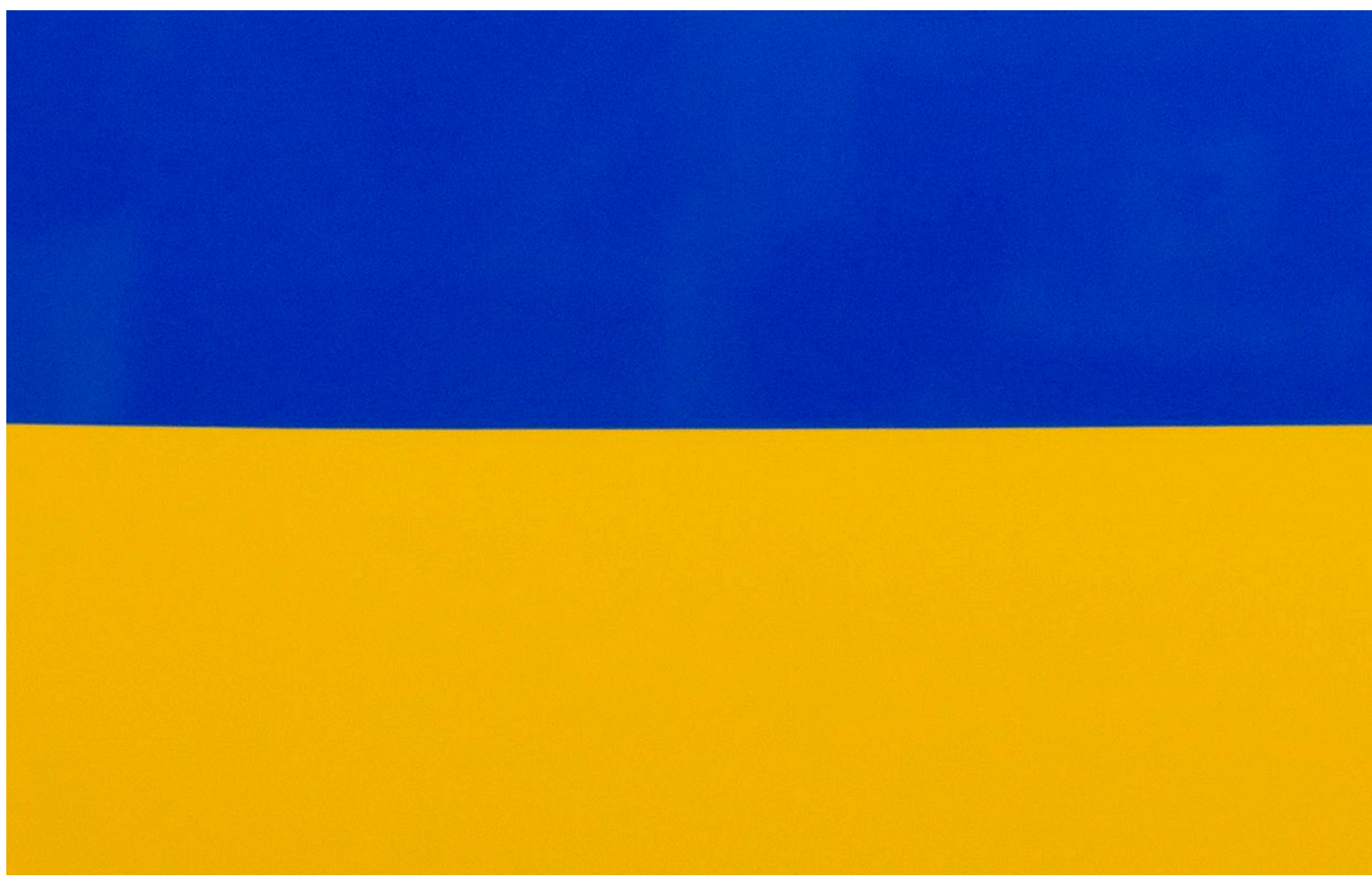
Edge Sealing Applying with a Brush Installation completed

3M recommends liquid 3M™ Edge Sealer 3950, 4150S, ES2000, or 3M™ Edge Sealer Tape 8914 for the graphics needing edge protection.

⚠ **For more information about edge sealing recommendations, see Instruction Bulletin 5.45.**

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In the event of non-compliance with 3M cleaners/cleaning a 3M™ MCS™ Warranty is void.

The warranty coverage for eligible graphics is based on the user both reading and following all applicable and current 3M™ Graphics Product and Instruction Bulletins. The warranty period for eligible graphics is as stated in the 3M™ Graphics Warranties matrices, found at **3M.com/graphicswarranties**, at the time that the film was purchased. The warranty period may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin. The warranties set forth in this Bulletin are made in lieu of all other express or implied warranties, including any implied warranty of merchantability, fitness for a particular purpose, or arising out of a course of dealing, custom, or usage of trade. All warranty coverage is contingent upon using the 3M Graphics Products as described in the applicable 3M Graphics Product and Instruction Bulletins. Failure to follow such description and instructions may void all warranties and limited remedies.

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Important Documents

Instruction Bulletin 5.1 — Select and Prepare Substrates for Graphic Application

Instruction Bulletin 5.45 — Maintenance

Pre-Application Checklist

Quality Inspection Checklist

Post-Installation Certificate

For additional help with installation, please contact your local 3M Representative.

For additional help with installation, please contact your local 3M Representative.

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