

# 3M™ Window Film Installation

## Film-to-Glass Recommendation Table

The following table is meant to be used as a guide to provide for improved installation quality and minimal confusion. We have seen that installing a film designed for flat glass application onto a vehicle can result in serious issues at times. Installing automotive films onto flat glass can cause problems as well.

Recommended **(R)**

Non Standard Application. Specifications may not meet customer requirements. **(NSA)**

Not Recommended. **(NR)**

Products	Automotive Category	Flat Glass Category		
		Automotive General Purpose	Commercial (Internal)	Residential (Internal)
<b>3M™ Safety &amp; Security Window Films (1)</b>				
Ultra S150 (SCLARL150), Ultra S400 (SCLARL400), Ultra S600 (SCLARL600) & all tinted safety films	NR	R	R	NR
SH4, SH7, SH8, & SH14	NSA	R	R	NR
SCLARL400D	NSA	R	R	NR
S50NEAR400D – New version in 2006	NSA	R	R	NR
<b>3M™ Automotive Window Films</b>				
Crystalline Series	R	NR	NR	NR
Color Stable Series (3,4,5)	R	NSA	NSA	NR
FX XT Series (4)	R	NR	NR	NR
FX XT HP Series (4)	R	NR	NR	NR
FX XT 70	R	NR	NR	NR
Black Chrome Series (4)	R	NSA	NSA	NR
<b>Flat Glass Films</b>				
Prestige Series	NR	R	R	NR
Ceramic Series	NR	R	R	NR
Night Vision Series	NR	R	R	NR
Traditional Series	NR	R	R	NR
<b>External Series</b>				
Exterior Prestige 90 (2)	NR	NSA	NSA	R
Exterior Prestige 40 and 70	NR	NR	NR	R
Exterior Metallized Film Series	NR	NR	NR	R

Footnotes:

1 – Safety films are “Non Standard” or “Not Recommended” in Automotive because of their thicker layer of adhesive..

2- Exterior Prestige 90 is the ONLY exterior film that can be applied on the interior. There is no color in the hardcoat or the adhesive, so there is no risk of increased absorption by installing on the interior. Exterior PR40 and Exterior PR70 CANNOT be installed on the interior due to glass breakage risk

3 – Color Stable used in Flat Glass is a “Non Standard Application” because of thermal stress factors.

4 – Black Automotive films have more color change than Flat Glass films and are therefore “Non Standard” or “Not Recommended” for Flat Glass.

5 – Appearance specifications and product design make Windshields a “Non Standard” or “Not Recommended” application.

### Important:

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## Flat Glass

### Tools and Equipment

#### Authorized 3M Sun Control WF Distributor

Film dispenser with spare cutter head assembly  
Replacement blades for film dispenser  
Three-gallon (11 liter) plastic PRESSURE spray tank - 8' - 10' (2-3m) plastic hose  
Replacement nozzle for three-gallon spray tank  
8" (20 cm) Window cleaning squeegee with replacement rubbers  
20" (50 cm) Window cleaning squeegee with replacement rubbers  
5" (13 cm) Film application squeegee with replacement blades recommended for Safety Films  
6" (15 cm) Film application squeegee with replacement blades  
8" (20 cm) Film application squeegee with replacement blades  
1" (25 cm) Window scraper with replacement blades  
4" (10 cm) Window scraper with replacement blades  
Five-way tool  
Olfa knives with replacement break-away blades  
Positioning solution (see page)  
36" (90 cm) and 72" (1,8 m) Straight ruler (metal)  
Miscellaneous metal or plastic trim guides

#### Miscellaneous Hardware & Equipment

##### Available locally

15' (5 m) or 25' (8 m) Flexible steel measuring ruler  
Waist apron  
Drop cloths (absorbent)  
Lint-free towels  
Scissors  
Screwdrivers  
Pliers  
Claw hammer  
Allen wrench set  
Vacuum cleaner (aqua-vac)  
Small paint brushes (for edge sealer)  
3M™ Brand masking tape  
Sponges  
Edge Sealer - 3M™ Clear Auto Sealer - Part #08551 - for exterior and interior  
Step ladders and extension ladders  
Scaffolding or access equipment as required

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# 3M™ Window Film Installation

## Tool and Equipment Inspection

### Inspect Before Leaving For Application Site

1. Film Dispenser
  - a. New sharp blades
  - b. Alignment of horizontal cutter
  - c. Spare blades
  - d. Clamp bar - surface clean and positive grip
2. Plastic Pressure Spray Tank
  - a. No Leaks
  - b. Flush out before filling
3. Squeegees
  - a. Clean, Straight, Flat and Sharp
  - b. Blade edge - replace if worn or nicked
4. Application Squeegee Repair
  - a. Rub across edge with 400 or 600 grit 3M **Wetordry**™ brand sandpaper
  - b. Maintain good square edge
  - c. If nicks and chips are still present, use 200 or 300 grit 3M **Wetordry**™ brand sandpaper. Go back and finish off with 400 or 600 grit 3M **Wetordry**™ brand sandpaper.
5. Knives
  - a. Use break-away blades
  - b. Use new tip after 3 cuts
  - c. Use stainless steel blades

## Film Inspection

### Inspect Before Leaving For Application Site

1. Correct Film
2. Correct Sizes
3. Free of Visual Defects
  - a. Edge damage
  - b. Buckles
  - c. Wrinkles
4. Sufficient amount of film and proper run number

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# 3M™ Window Film Installation

## Window Preparation

1. If possible, Customer should provide clear access to window
2. Protect floor, carpet, window ledge, wall, etc., with suitable absorbent material (drop cloth) - not plastic
3. Turn off or cover heating/AC and ventilation ducts
4. Set film dispenser when required
5. Have tools and supplies as close to the window as possible

## Clean Glass and Frame

- Wipe down window frame with damp cloth or sponge
- If window putty or seal is old and cracked, tape or seal prior to washing glass
- Wash window using pressure spray tank
- If glazing is in good condition, flush edges
- Scrape glass
- Thoroughly rinse glass from top to bottom with pressure spray tank
- Squeegee entire glass surface
- Dry glass edge and window frame

## Film Application

1. Lightly Spray Liner Side with Slip Solution to reduce static.
2. Cut Film 1" (2.5 cm) Wider and 1" (2.5 cm) Longer Than Glass Size.
3. Spray Glass with slip solution and lay Film on Glass with Adhesive Side Toward You. Note, thoroughly wet the adhesive with slip solution.
4. Remove Liner
5. Wash Fingers if needed to remove any remaining adhesive on fingers. By removing any existing adhesive on fingers, when turning film on glass positioning of film will be easier to control.
6. Turn Film Around and Apply to Glass.
  - A. Position right side and top, leaving 1/8" (3mm) border.
  - B. If window is not square, all edges might need trimming.

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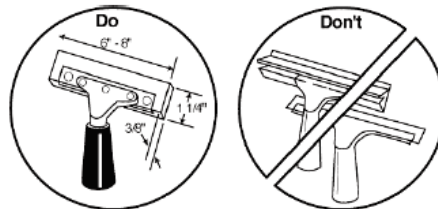
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# 3M™ Window Film Installation

## Film Application

### I. First Squeegee.

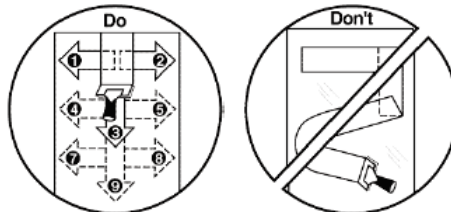
- A. Use proper squeegee



**Note: Slip Solution** – for all 3M Window Film Types. Slip Solution is defined as 1 ½ caps of Johnson Baby Shampoo per gallon of water. Modify slip solution if film sticks to glass or is too slippery.

It is extremely important to use the correct amount of slip solution in the spray water. Too much slip solution in the water can cause lack of adhesion, fingering, excess haziness, and slow drying.

- B. Lightly spray film surface.  
C. Use proper squeegee pattern.



- D. Always keep squeegee blade lubricated during squeegeeing.

### II. Trim Film to Size

- A. Use trimming guide.  
B. Trim within 1/8" (3mm) of window edge.
  - Water removal
  - Reduce dirt entrapment at edge
  - Prevent edge damage
  - Prevent edge corrosion

C. Always use new blade tip after 3-4 cuts.

### III. Relubricate with Slip Solution and Squeegee (Using Squeegee and Squeegee Pattern Mentioned Above) Until All Water is Removed.

### IV. Dry Edges (Bumping).

- A. Bump film edge with absorbent lint-free towel wrapped around edge of Five-Way tool.  
B. Wipe frame edge dry.

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# 3M™ Window Film

## Installation – Safety and Security Window Films

3M™ Safety & Security films install differently than the standard Sun Control or Architectural films. Because they are generally thicker, their proper installation requires added squeegee pressure and special technique to ensure maximum water removal. In addition, some water may remain behind, causing a haze and blotchy appearance. This is completely normal and may take several weeks to dry. For the best results, follow the techniques outlined below.

3M™ Ultra Series Safety & Security films feature a unique microlayer construction that makes them more flexible than films of similar thickness. This allows for easier application. When cutting 3M™ Ultra Series films, it is required that the film be cut all the way through -- do not try to tear at an edge. It may pull the film off the glass requiring additional spray and reapplication.

### Window Preparation

Whenever possible, the customer should provide clear access to window. Protect floor, carpet, window ledge, wall, etc., with suitable absorbent material such as a drop cloth. It is not recommended to use plastic sheeting on the floor as it may become too slippery. If possible, turn off heating/AC and ventilation ducts to reduce dirt and dust in the air or on the glass. Set up film dispenser (or box) for cutting. Have tools and supplies as close to the window as possible. A tool belt for the applicators is recommended.

### Clean Glass and Frame

Wipe down window frame with damp cloth or sponge.  
If window putty or seal is old or cracked, tape or seal prior to washing glass.  
Wash window using pressure spray tank and slip solution.  
Thoroughly flush edges.  
Scrape glass using window scraper and proper blades.  
Thoroughly rinse glass from top to bottom with pressure spray tank.  
Squeegee entire glass surface.  
Dry glass edge and window frame.

### Film Application

Lightly spray glass with slip solution.  
Cut film 1" (25 mm) wider and longer than glass surface  
Lay film on glass with liner or adhesive side toward you.  
Remove liner. In dry conditions, to minimize dust, you may want to spray the liner with some slip solution before removing.

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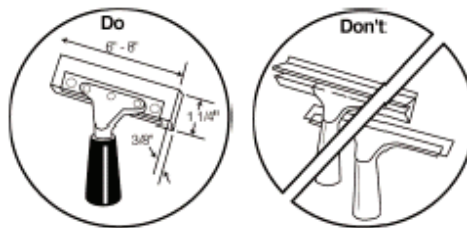
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## Installation – Safety and Security Window Films

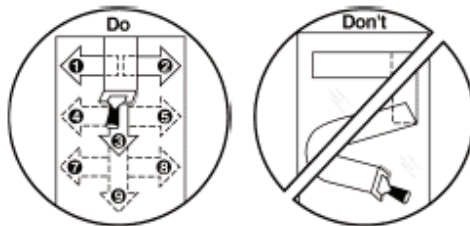
- **IMPORTANT:** If film contains overcoat, thoroughly wash off overcoat using slip solution in a plastic pressure spray tank. Apply enough water solution so that it is running off the bottom of the film. Refer to guidelines on Proper Overcoat Removal.



- Wash fingers with slip solution.
- Turn film around and apply to glass.
- Position right side and top, leaving 1/8" (3 mm) border between the edges of the film and frame
- If window is not square; all edges might need trimming.
- Squeegee film to glass using proper squeegee. The proper squeegee is no more than 6 inches wide. The squeegee should be straight, sharp, flat and free of cuts nicks or other defects. The "Blue Max" is recommended. If the blade is too hard or soft, water removal will be difficult.



- Lightly spray film surface with positioning solution.
- Use proper squeegee pattern and use both hands to apply firm pressure:



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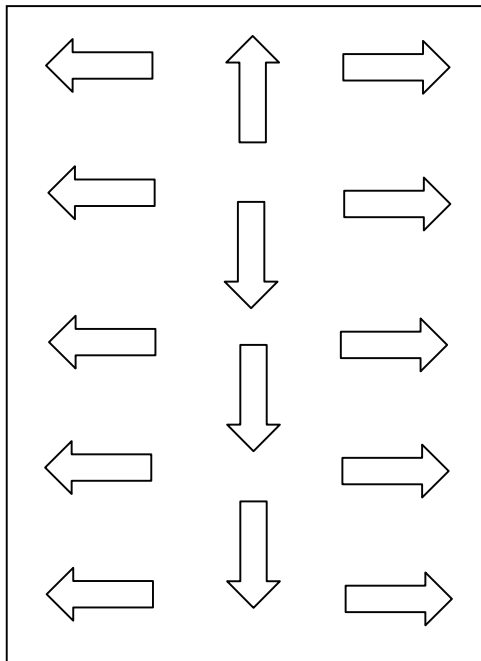
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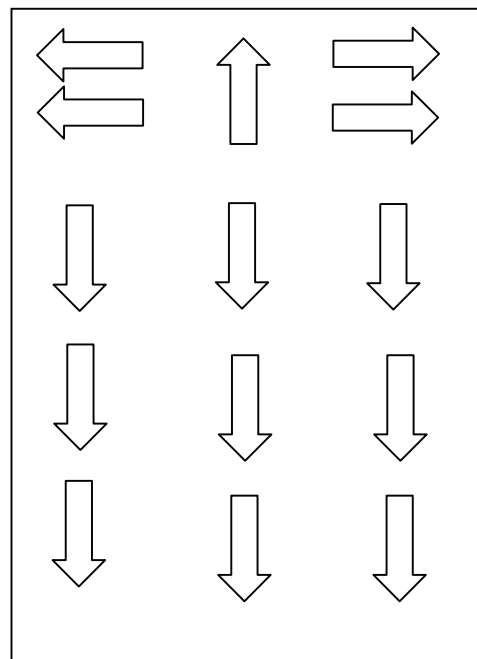
# 3M™ Window Film

## Installation – Safety and Security Window Films

- Always keep squeegee blade lubricated with positioning solution.
- The first squeegee pass is the most critical for removing water to achieve a high quality installation. Be sure to apply firm pressure using both hands and 50% overlap on the first pass.
- Thicker films compound the difficulty of removing the maximum amount of water on the first pass. Illustrated below are two squeegee techniques. The technique on the left is acceptable for thinner films (less than 6 mils thick). For thicker films, it is recommended to use the technique illustrated on the right:



**Thin Films Technique**



**Thick Films Technique**

- The Thick Films Technique will produce great results for thin films but the Thin Films Technique may not produce acceptable results for thicker films.
- Allowing gravity to work with you to remove the water helps achieve a quality installation with minimal effort.
- Squeegeeing more than once should not be necessary if properly done the first time
- Trim film to size using a trimming guide and OLFA knife to within 1/8" (3 mm) of window frame.
- Always use new blade tip after a maximum of 3 cuts for thin films and after every cut for security films.
- Re-lubricate with slip solution and re-squeegee (using squeegee and squeegee pattern mentioned above) until all water is removed.
- Bump film edge with absorbent lint-free towel wrapped around edge of five-way tool.
- Wipe frame edge dry.

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# 3M™ Window Film Installation

## Champagne Bubble Reduction and Proper Overcoat Removal

3M™ Ultra Series Safety and Security Window Films are made with a special adhesive “overcoat” to facilitate removal of the liner and to allow for easier repositioning of the film on glass. While the overcoat makes handling of the film easier, it is critical that it be washed off properly to ensure a quality film installation with minimal defects. Residual overcoat may lead to “champagne” bubbles, which may not be readily visible immediately after the film installation.

The following 3M™ Ultra Series Safety and Security Window contain an adhesive overcoat:

- Ultra Prestige PR S50 & Ultra Prestige PR S70
- Ultra Night Vision S25
- Ultra Silver S20
- Ultra Neutral S35 & Ultra Neutral S50

**Properties of the Overcoat:** The overcoat turns into a gelatin-like substance when wet. It is soluble in cold water but insoluble in hot water (>120°F). Due to its unique temperature-dependent solubility properties, it is extremely important that as much overcoat is removed as possible before applying the film to glass – especially on glass that is already hot during the film installation or on glass that is likely to get hot before the film has completely dried. Residual overcoat that is trapped in a thin layer of hot water between the film and glass may begin to solidify, which could lead to an irreversible “champagne bubble” defect that could develop until the film has completely dried (usually within 7 days).

**Overcoat Removal Instructions:** The film adhesive must be washed with water / slip solution. Simply wetting the film with slip solution is not enough to wash off the overcoat. Begin washing the adhesive at the top of the film, allowing a front of water to gravitate down the film while slowly washing the rest of the film below. The slip solution should be running off the film (along with the overcoat) when washed properly.

**CAUTION using ‘Reverse Roll’ Techniques:** Reverse rolling is a convenient method of applying film on large windows. This method involves spraying slip solution onto the glass and unwinding the roll along the glass. Spraying the glass only is NOT a sufficient means of overcoat removal. If using a reverse roll technique to separate film from liner, it is necessary to remove the film from the glass to thoroughly wash off the overcoat as described above before repositioning the film for final application.

Employing the following general best installation practices will also help reduce the chance of residual overcoat induced champagne bubble formation:

- Avoid working under conditions when the glass is hot (glass surfaces that are or likely to be above 120°F within 72 hours)
- Use a stiff squeegee blade that is sharp, straight, and flat; and no wider than 6 inches
- Use just enough soap in the slip solution to allow for easy repositioning of the film on the glass – no more, less.
- Overlap squeegee strokes by at least 1/3, angling the squeegee towards the wet areas of the film. Forcing water through dry areas of the film can also lead to champagne bubbles. Squeegeeing areas more than once should not be necessary when employing the proper pressure and squeegee tools.

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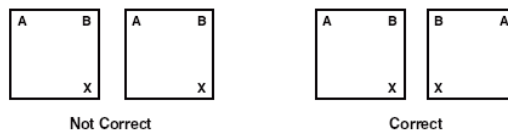
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# 3M™ Window Film Installation

## Splicing

- Position and direction of splice must be determined by salesperson and customer prior to film installation.
- Leave instructions with customer that window washers should be aware of splice and squeegee window from direction of film that is on top.
- Always match factory edge to factory edge - Mark edge with masking tape.
- To reduce the risk of splice joint gap, squeegee parallel to the film edges to be joined



## Overlap Splice

1. Overlap splice pieces about 1" (25 mm) and draw back to 1/8" (3 mm)
  - a. Horizontal splice - upper piece overlapping lower
  - b. Vertical - Left-hand piece over right-hand piece
2. Slowly squeegee parallel to overlap splice - lubricate film as required
3. Squeegee out maximum amount of water
4. Overlap splice is preferred for Safety and Security Window Films (overlap splice must be 1/8" - 1/4" (3-6 mm))

## Butt Splice / Cut Through Splice

1. Overlap film pieces 1" (25 mm)
2. With new sharp blade and a straight edge, cut through both pieces in exact center of overlap  
NOTE: Use a new blade for each and every splice cut
3. Remove small piece from top, lift corner of bottom panel and remove lower smaller piece (spray water on splice during this process)
4. Slowly squeegee parallel to splice - lubricate as required
5. Squeegee out maximum amount of water

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# 3M™ Window Film Installation

## Edge Sealing

### Why Edge Seal?

1. Protect edges from moisture
2. Prevent corrosion
3. Protect during washing
4. Helps protect against vandalism

NOTE: Edge sealing is a MUST for ALL metalized external film applications or no warranty claim will be accepted- Edge sealing is not required on Exterior Prestige applications unless water may pool on the frame edge (example non-vertical glass where there is no drainage around the bottom edge of frame)

### How to Edge Seal

1. Use 3M Clear Auto Sealer (part #08551). Available through automotive paint and body equipment suppliers
2. Surface must be clean and dry
3. Apply with small paint brush or cotton swab
4. Avoid sealant running down surface of film

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# 3M™ Window Film Installation

## Weather Guidelines – Interior Film

The main concern with installing film at temperatures below freezing would be that any water left behind during installation would freeze and cause a visible defect in the film. Thus the best method for reducing any potential problems would be to take extra care to remove all excess water during installation. The only way that the water could potentially freeze would be if the temperature of the interior pane of glass dropped below 32 °F. Below are a few recommendations to look for when installing in cold temperatures. As a general rule these guidelines would be recommended any time temperatures are expected to be under 0 °F for double pane glass or under 32 °F for single pane glass, within 72 hours of the installation period.

1. Check the temperature of the interior pane of glass, with an understanding that the temperature of the glass will drop significantly at night. If the temperature of the interior pane is less than 32 °F do not install film.
2. Spray the glass with film mounting solution, if the mounting solution freezes do not install film.
3. Use a temperature gun to determine the temperature of the frame of the window right next to the glass. Water left around the edges of the glass could freeze due to the frame
4. Check to see if heating vents are directed at the glass and will hold that glass at a warmer temperature, often allowing film installation at significantly lower outside temperatures.
5. Determine what temperature the building is kept at during the night. Often unoccupied spaces, or spaces being renovated will be kept at much lower temperature, as are some buildings that utilize temperature setbacks at night.

In general, there are very few days that would prohibit film installation in the US climate. The interior temperature of the building will typically hold the interior glass temperature above 32 °F. The above are situations to be aware of, as well as suggestions to minimize the risk of installing film in temperatures that are too low.

## Weather Guidelines – Exterior Film

1. Do not install film during precipitation, as this will cause debris to run off the building and get behind the film
2. Do not install film if the exterior temperature will drop below 32F in the next 15 days
3. Do not install film if the temperature of the exterior glass exceeds 120F or is too hot to touch, in some cases you may need to ensure that you are installing film on the side of the building that is not getting direct sunlight during the time of the installation
4. Check for windy conditions

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# 3M™ Window Film

## Important Details about your Installation of 3M™ Sun Control Window Film

Dear Customer:

Congratulations! You have just purchased a superior sun control film. 3M has devoted 30 years to the development and improvement of 3M™ Sun Control Window Film so that today you may enjoy the sun without experiencing the full effects of its harmful rays.

As with all products containing an adhesive system, a drying time is necessary to achieve the proper bond to the window. During this process, some changes may be observed. So that you will understand these differences, we would like to note some of them for you. They are normal and should be expected. Listed below, by way of recap, are the points covered by your Authorized Dealer.

- Drying time will be approximately 30 days. Please do not wash your windows during this period.
- Any haziness you may see is water under the film. You will see less and less of this as the days pass.
- A milky appearance might be experienced, but it too disappears during the drying period.
- All water bubbles will dry out, but a few small particles or points may be apparent when dry. These points, generally seen from the outside, are very tiny and are inherent in the use of a pressure sensitive adhesive system. An adhesive of this type is used because it is the only one that will withstand high humidity, driving rains and window condensation. You will normally see these particles only if you get quite close to the glass, which is something we ordinarily do not do. They will not affect the films performance.

The 1/8" (3 mm) border you notice is a requirement of the application according to 3M.

- Cleaning should be done using normal household window cleaners\* or any non-abrasive window cleaning solution and wiping with a soft towel or squeegee. Paper towels or natural sponges should not be used.

NOTE: Sometimes what seems to be a defect in the film is, in fact, an imperfection in the glass. It is quite natural that one should look closely at a new purchase, but at times we observe things that were always there but never noticed. A good rule to follow is to look at the installation from six feet away. This is the manner in which we normally look through a window and the way in which you should observe your 3M™ Sun Control Window Film — looking through it, not at it.

We and 3M hope you will enjoy your installation. With proper care, we know you will receive many years of benefit from its presence on your windows.

Very truly yours,

---

Authorized Dealer/Applicator

\*See warranty for cleaning instructions.

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St. Paul, MN 55144-1000  
1-800-698-4595  
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# 3M™ Window Film Installation

## Care and Cleaning Instructions for 3M Films

1. CARE MUST TAKEN NOT TO SCRATCH THE FILM, DO NOT USE BRISTLE BRUSHES OR ABRASIVE CLEANING MATERIALS
2. Household window cleaning solutions, such as Windex, are recommended
3. A soft cloth or clean synthetic sponge is recommended for washing. Do not use the same towel or sponge for wiping sills or frames. Paper towels or newspapers not recommended
4. A soft squeegee is recommended for removal of cleaning solution from the film
5. Do not apply heavy pressure in any cleaning operation
6. TIPS:
  - a. Additional caution is recommended when cleaning spliced areas. Clean in the direction of the splice
  - b. Do not leave the film wet
  - c. Make sure you use a different sponge, cleaning cloth and water bucket for cleaning the outside and the inside of the windows
  - d. Use a little extra detergent for cleaning 3M™ Sun Control Window Film — it gives more ease to squeegeeing



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## Film Removal

1. Lift edge and try to pull off in sheets
2. If film is wider than 1' to 2' (30 to 60 cm), carefully cut into 1' to 2' (30 to 60 cm) strips  
OR
3. Spray solution of ammonia and water onto film
4. Apply plastic film or newspaper on film
5. After one to two hours of soaking, lift edge and pull off in sheets
6. Clean adhesive residue with scraper using solution of ammonia and water



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# 3M™ Window Film Installation Application *Do's* and *Don't's*

## Application *Do's*

1. **Do** apply film on clean glass
  - a. Better application
  - b. Use 3M™ Scotch brand Magic Mending Tape to test for adhesion
2. **Do** use a sufficient amount of positioning solution during application
  - a. Wash off overcoat
  - b. Cleaner application
3. **Do** use plastic or stainless steel pressure spray tanks
  - a. More consistent cleaner applications
4. **Do** use plenty of new sharp stainless steel blades during cutting and trimming
  - a. Less fingers
  - b. Film lays down better
  - c. Won't scratch glass
5. **Do** apply film on entire surface of glass
  - a. Partial application can cause breakage (added stress)
  - b. No glass breakage warranty on partial applications
6. **Do** squeegee out the maximum amount of water
  - a. Less drying time
  - b. Better adhesion
  - c. Better overall performance and visual appearance
7. **Do** allow 1/8" (3 mm) to 1/16" (1.5 mm) border between film and molding
  - a. Water removal
  - b. Reduce dirt entrapment at edge
  - c. Reduce edge damage
  - d. Reduce edge corrosion
8. **Do** apply film on clean glass
  - a. Protect against elements
  - b. Reduce edge corrosion
  - c. No warranty if not edge sealed
9. **Do** use absorbent lint-free towels
  - a. Cleaner application

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# 3M™ Window Film Installation

## Application Don'ts

1. **Don't** use too much slip/positioning solution concentrate in the mixture with water
  - a. Less adhesion
  - b. More fingers
2. **Don't** use steel pressure spray tanks
  - a. Rust between film and glass
3. **Don't** use silicone polish after installation
  - a. No emissivity with 3M™ Sun Control Plus Window Films
4. **Don't** add alcohol or other additives to slip/positioning solutions
  - a. Detackifies adhesive
  - b. Adhesive failure
5. **Don't** use double application of films
  - a. Heat build-up - glass breakage
  - b. Lack of adhesion
  - c. Longer drying times
6. **Don't** apply film on plastics
  - a. Heat and light cause outgassing
  - b. Bubbles occur
  - c. Can't remove adhesive
7. **Don't** apply film to chipped, broken or damaged glass
  - a. No warranty
8. **Don't** apply films onto glass on restricted list without submitting Glass Breakage Checklist
  - a. No warranty
9. **Don't** apply film in building under construction
  - a. High dust/dirt level
  - b. Drying time with temperature differences

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