

**IMPORTANT:** This Technical Bulletin provides an overview of window film installation techniques for the 3M Safety & Security Window Films as defined in this Bulletin. Prior to initial product selection, always refer to current 3M Technical Data Sheets and 3M Technical Specifications for more detailed product information and specifications.

## 1.0 Definitions

For purposes of this Technical Bulletin, the following 3M window films are collectively defined as “3M Safety & Security Window Films”:

- 3M™ Scotchshield™ Safety & Security Window Films (Ultra S800, Ultra Prestige S70, Ultra Prestige S50, Ultra Night Vision S25)
- 3M™ Scotchshield™ Security Window Films (S2400)
- 3M™ Safety & Security Window Films (Safety S40, Safety S70, Safety S80, Safety S140, Safety S40 Exterior/S40X, Safety S70 Exterior/S70X)

## 2.0 General Installation Guidelines

Many installation factors can affect the aesthetics and performance of 3M Safety & Security Window Films. This guide is designed to provide instruction for many of these key installation factors including the environment, the condition and type of squeegee, slip solution and application techniques. Following this guidance for all flat glass window film installations of 3M Safety & Security Window Films will contribute to a professional and quality film installation.

These guidelines are not exhaustive. Each 3M Authorized Window Film Dealer is responsible for adopting generally accepted industry standards and practices for the delivery of window film installation services.

**IMPORTANT:** 3M Safety & Security Window Films must be installed with the 3M™ Impact Protection Attachment (IPA) Sealant (“3M IPA”) for all windstorm, break & entry, and explosion mitigation applications (if the 3M Safety & Security Window Film is approved for such applications) and for all spontaneous glass breakage applications on single pane tempered glass. **3M SAFETY & SECURITY WINDOW FILMS ARE NOT BULLETPROOF AND ARE NOT DESIGNED TO STOP INTRUDERS.**

**IMPORTANT:** All 3M Window Films must be installed strictly in accordance with 3M Technical Specifications and 3M instruction guidelines.

## 3.0 Preparation

**3.1 Read 3M Technical Data Sheets, Technical Bulletins and Technical Specifications.** Prior to commencement of the installation, always read the 3M Technical Data Sheets and 3M Technical Specifications for the window film selected by the customer, along with all other applicable 3M Technical Bulletins and Instructions including, but not limited to those for 3M IPA (if required or recommended for the installation). The film and 3M IPA must be applied strictly in accordance with 3M specifications and 3M instructions.

**3.2 Examine Glass Surfaces.** Examine glass surfaces intended to receive new film and verify that they are free from defects and imperfections, which will affect the final appearance and potentially the as-installed performance. Correct all deficiencies before starting film application.

Defects and imperfections in the glass surfaces that cannot be corrected prior to installation should be called to the end customer’s attention and documented in writing.

**3.3 Provide Clean and Dust-Free Work Area.** A clean and dust-free work area should be provided when the films are installed. Good installation will minimize contamination so that it is not obtrusive to the viewer.

Window film installation should be performed only after all other construction trades have completed work to help ensure a clean and dust-free work area when the films are installed. Pay attention to ventilation systems that may deposit contamination including those ventilation systems circulating air from surrounding interior or exterior work areas.

Examples (and sources) of visible defects are:

- Dirt, debris, hair, and fiber particles (contamination)
- Adhesive gels, film color variation (product)
- Fingerprints, air bubbles, scratches, tears, large gaps, and creases (application)

Some level of contamination near the edges of the film is difficult to avoid and can be expected. Some particles are acceptable where poor frame condition makes contamination unpreventable. Similarly, applications of exterior window films have numerous sources of uncontrolled debris and may require acceptance of lessened optical clarity.

**3.4 Pre-Cut Window Films to Size, if Feasible.** In certain installations, pre-cutting all or a portion of window film for a project at the facilities of the 3M Authorized Window Film Dealer (in contrast to at the project site) may contribute to efficiency of the installation.

- To minimize waste, the film should be cut to specification utilizing a vertical dispenser designed for that purpose. Film edges must be cut neatly and square at a uniform distance of 1/8" (3 mm) to 1/16" (1.6 mm) of the window-sealing device.
- Unlike sun control window films, 3M Safety & Security Window Films are stiffer and more difficult to press into the corners for trimming to size on the glass. Pre-cutting the film can make installation easier and faster. The recommended technique is to cut the film to the proper size (e.g., plotter cut all four edges), or to cut three film edges (e.g., using a film handler) and trim the fourth edge on the window using a stainless-steel blade.
- Important Handling and Storage Instructions: You must handle and store pre-cut film in a flat position or rolled tightly on a core to avoid liner separation or "tunneling".

**3.5 Deliver Absorbent Materials to Project Site.** Drop cloths or other absorbent material are required for all installations and will need to be placed on the windowsill or sash to absorb moisture accumulation generated by the film application.

**3.6 Deliver Window Films to Project Site and Store.**

If window films are not pre-cut, window films should be delivered to the job site in the original, unopened containers with 3M labels intact and legible.

If window films are pre-cut, the pre-cut window films should be delivered to the job site in a flat position or rolled tightly on a core to avoid liner separation or "tunneling".

**3.7 Preparation of Project Site, if Applicable.** Certain actions may need to be taken in order to prepare the end customer's site for window film installation including, but not limited to, removal and reattachment of existing window treatments, lighting fixtures, window and door mullions, trim work, furniture or personal property and/or segregation of the work site from pedestrian traffic. Review these actions and any associated costs (if applicable) with the end customer prior to commencement of the installation.

## 4. Installation at Project Site

**4.1 Cut Window Films to Size.** If films are not pre-cut at the 3M Authorized Window Film Dealer's facility, the window film may be cut at the project site.

- To minimize waste, the film should be cut to specification utilizing a vertical dispenser designed for that purpose. Film edges must be cut neatly and square at a uniform distance of 1/8" (3 mm) to 1/16" (1.6 mm) of the window-sealing device.
- Unlike sun control window films, 3M Safety & Security Window Films are stiffer and more difficult to press into the corners for trimming to size on the glass. The recommended technique is to cut the film to the proper size (e.g., plotter cut all four edges), or to cut three film edges (e.g., using a film handler) and trim the fourth edge on the window using a stainless-steel blade.

Visible gaps between the film and the frame/gasket can be expected with window film that is either pre-cut or cut at the project site. Visible gaps are typically as wide as 1/8 inch (3mm).

Important Handling and Storage Instructions: You must handle and store pre-cut film in a flat position or rolled tightly on a core to avoid liner separation or "tunneling".

**4.2 Clean Glass Surfaces and Framing.** Immediately prior to installation, all glass windows and doors, and their framing, must be cleaned thoroughly with a neutral pH cleaning solution. The inside and/or exterior surface of the glass may need to be scraped with stainless steel razor blades with clean, sharp edges to ensure the removal of any foreign contaminants without damaging the glass surface.

### 4.3 Create Slip Solution and Clean.

- Begin by creating a slip-solution. Using a mild, non-lotion containing liquid detergent (e.g., Johnson's® Baby Shampoo), start by mixing about one teaspoon of mild detergent to one gallon of water. Adjust the concentration of detergent as necessary, depending on the temperature and humidity of the installation environment. The goal is to use the smallest amount of shampoo in the slip solution to allow for positionability of the film during installation. Sufficient slip solution should be created since the slip solution is used both for this cleaning step and for the application of the window film to glass surfaces.
- Wipe down the window frame on the installation side with damp cloth or sponge.
- As needed, clean the glass using the slip solution and, if needed, use a window scraper (stainless steel blade only) or a white Scotch-Brite™ scrubber, to remove additional residue. Thoroughly rinse glass from top to bottom with slip solution, and squeegee dry the entire glass surface.
- Dry the glass edges and window frame with an absorbent, lint-free towel.

**4.4 Recommended Squeegee Techniques.** Familiarize yourself with and follow these techniques for using a squeegee. This is a critical process in the installation of window film.

- To help ensure efficient removal of excess water from the underside of the film and to maximize bonding of the pressure sensitive adhesive, plastic bladed squeegees should be used.
- Two hands are needed to apply the required pressure for films greater than 4mil thick (100μ). With one hand on the handle, place the other hand near the squeegee blade and press firmly against it during each squeegee stroke.

- Keep the squeegee directly in front of you at chest level to ensure good squeegee pressure. Always push the squeegee away from the center of your body. Pulling or dragging the squeegee typically cannot generate enough pressure, and the squeegee path can be more difficult to control.
- Overlap each adjacent squeegee stroke by at least 1 inch (25 mm) to ensure that all areas of the film have been squeegeed. With each adjacent stroke, angle the squeegee blade to push slip solution toward the uninstalled regions of the film.
- Rushing through the squeegee process will normally result in trapped slip solution bubbles and reduced squeegee pressure. Observe your squeegee strokes and ensure they are overlapping properly.

## 4.5 Specific Installation Steps (Applying Window Film to Flat Glass)

- To minimize contamination on the adhesive, wash your fingers with slip solution before handling, and spray the adhesive with slip solution as the liner is removed. Spray the glass surface with slip solution as well before placing the film on the glass.
- If there are numerous large air bubbles trapped under the film before squeegeeing, a window cleaning squeegee (wide, soft rubber blade) with light pressure may be used to remove some of the trapped air prior to using the security film squeegee.
- Position the top side of the film up to the top edge of the glass, and then slide the film into position leaving no more than 1/8" gaps around the window or door gasket edges.
- Once in place, lightly spray the entire film surface with the slip solution so that the squeegee can slide over the film surface. This slip solution will also be a visible guide to help you identify which areas have been squeegeed during installation.
- Tack the film in place by applying squeegee pressure at the top and middle of the film. Starting from this point, squeegee left and then squeegee right to lock in the top few inches of the film adhesion. Be sure to use overlapping squeegee strokes to remove the slip solution and angle the squeegee blade to push slip solution toward the uninstalled regions of the film.
- When using the proper installation techniques, the film installation can be accomplished with only one firm pass. Multiple squeegee passes can result in pre-adhesion and then sliding of the adhesive, leaving small areas of deformed adhesive. No more than two passes are recommended.
- If the film was cut to size on only three sides, do not squeegee the film down on the fourth edge until you trim the film to size using a stainless-steel blade and a straight edge or plastic applicator to hold the film in the corner of the window.
- Squeegee the window edges again. Using an absorbent lint-free towel wrapped around a plastic applicator, bump the film edges dry. Wipe the frame dry as well.

**NOTE:** 3M™ Scotchshield™ Security Window Film S2400 has both an adhesive liner and a protective top sheet. The protective top sheet can be left on as an aid to installation but must be removed prior to application of 3M™ Impact Protection Attachment (IPA) Sealant.

## 4.6 Required Use of Splices and Overlap Strips

**Splices.** End customers may find film splices objectionable, but they are required when both dimensions of the glass are larger than the largest width available for the film.

A butt splice (versus an overlap splice) is recommended and can be achieved by placing the two pieces of film with the straight, factory-cut edges next to each other. The butt splice should be in a location where a force or impact is less likely to occur (e.g., up high for break & entry applications).

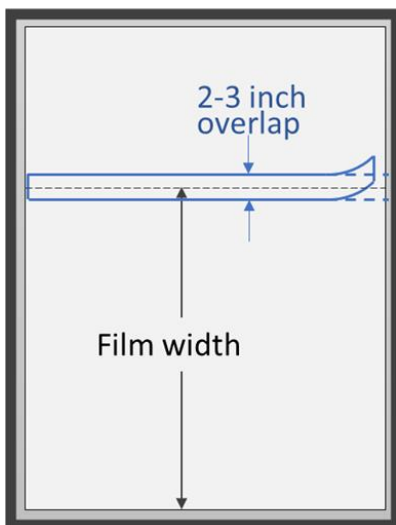
**Overlap Strips.** 3M recommends using an additional 2-3 inch wide overlap strip of 3M safety window film as follows: 1) for non-sun control film applications, use the same 3M Window Film used on the glass window or door where the splice is located, or 2) for sun control film applications, use a clear 3M safety window film. This additional strip is used to overlap the butt splice for best performance. Ensure that at least one-inch of the film is applied on each side of the splice (applied before the 3M IPA) as in [Detail 1](#). **Although end customers may find the overlap strip objectionable, 3M Authorized Window Film Dealers should advise end customers that a lack of a splice will jeopardize performance of the film during impacts such as windstorm, blast mitigation and break & entry and will void the warranty for that specific glass window or door application.** If the end customer refuses to accept a splice, all window locations in which the end customer has refused a splice should be documented in the installation records submitted for warranty coverage. Warranty coverage is not available for any window application of 3M™ Safety & Security Window Films for use in windstorm, break & entry, and explosion mitigation applications if the customer refuses required splices.

## 4.7 Required Application of 3M IPA

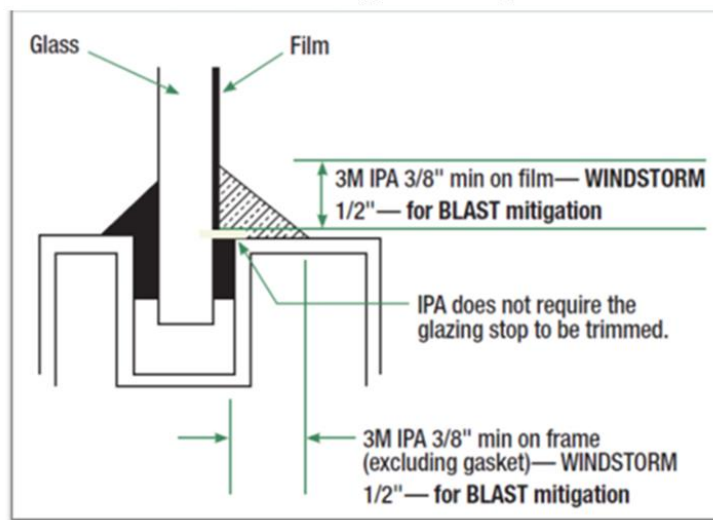
3M™ Safety & Security Window Films must be installed with the 3M™ Impact Protection Attachment (IPA) Sealant for all windstorm, break & entry, and explosion mitigation applications and for all spontaneous glass breakage applications on single pane tempered glass.

For installations in which 3M IPA is applied, end customers should expect a large triangular bead between the edges of the glass and the glass frame. See [Detail 2](#) below for a graphic depiction of a typical 3M IPA configuration, with the recommended triangular shape. The 3M IPA sealant is hand-applied, similar to a caulk, and will have a non-uniform appearance. However, 3M IPA should be applied smoothly with straight edges with minimal or no concavity to the IPA for best performance. Ideally the end customer should view a mock-up in advance of the application of the IPA.

Detail 1: Splice With Overlap



Detail 2: 3M™ IPA Sealant Typical Configuration



## 5. Post-Installation Requirements

5.1 After installation, any leftover material should be removed and the work area returned to its original condition.

5.2 **IMPORTANT:** After the installation is complete, provide end customer with the Technical Bulletin “Guidelines for Inspections, Cleaning and Maintenance”. This Technical Bulletin contains important guidelines for end customers regarding the cleaning and care of window films.

5.3 **IMPORTANT:** Instruct end customer to **NOT WASH** windows and door installed with window film for **30 days** after installation to allow adhesion to build.

5.4 **IMPORTANT:** Instruct end customer to place the following decal in conspicuous location to serve as a reminder to not wash windows. Fill in the decal with the appropriate date based on film type, interior or exterior application, and environmental conditions. **Do not adhere decal to filmed glass.**



**Note:** A larger image of this decal is displayed at the end of this bulletin for copying and use in the field.

## 6. Health & Safety

**⚠ WARNING.** To help reduce the risk of personal injury and/or property damage associated with glass breakage, when working on or near glass surfaces, always use appropriate personal protective equipment and follow the Technical Bulletin “3M™ Window Film Glass Checklist” to identify the risk of glass breakage associated with the application of window film to glass surfaces.

**⚠ CAUTION.** When using any equipment, tools, or cleaning solutions in connection with the processing and application of this Product, always follow the manufacturer’s container labels and/or instructions for safe operation.

*See the following pages for Important Product Notices and Warranty Information*



## 7. Important Product Notices

**CAUTION:** While 3M™ Window Films, when applied in accordance with 3M instructions, may help reduce the impact of flying glass shards under certain conditions and potentially delay intruders, **THESE FILMS DO NOT PREVENT PROPERTY DAMAGE, PERSONAL INJURY, OR DEATH. WINDOW FILMS ARE NOT BULLETPROOF AND NOT DESIGNED TO STOP INTRUDERS.**

**CAUTION:** Although certain 3M™ Window Films help block a certain percentage of UVA and UVB radiation and may have received The Skin Cancer Foundation Seal of Recommendation, the efficacy of these films in protecting against skin cancer has not been tested by 3M and **3M™ WINDOW FILMS DO NOT PREVENT SKIN CANCER.**

**IMPORTANT PRODUCT AND APPLICATION LIMITATIONS:** Many factors can contribute to potential hazards and damages arising from wind, impact, seismic, explosion, or break and entry incidents, including the window film selected, type and thickness of glass, building construction, exterior pressure, proximity of impact occurrence, quality of window or door frames, intruder size and strength, and type of tools used to gain entry. Certain 3M™ Window Films require the use of 3M™ Impact Protection Attachment (IPA) Sealant on glass window and door frames for windstorm, break & entry, and explosion mitigation applications and for spontaneous glass breakage applications on single pane tempered glass. The sealant may also be recommended for certain other spontaneous glass breakage, safety glazing, and seismic applications. Always refer to the 3M Technical Data Sheets and 3M Technical Specifications to determine whether these combinations are required. **Always consult with security professionals and a 3M Authorized Window Film Dealer prior to selecting any window films to determine suitability for the intended application.**

**IMPORTANT STATE OF FLORIDA NOTICE:** This product is not approved in the State of Florida for use as hurricane, windstorm, or impact protection from wind-borne debris from a hurricane or windstorm. In compliance with Florida Statute 553.842, this product may not be advertised, sold, offered, provided, distributed, or marketed in the State of Florida as hurricane, windstorm, or impact protection from wind-borne debris from a hurricane or windstorm.

## 8. Warranty Information

**Technical Information:** Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

**Product Selection and Use:** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

**Warranty, Limited Remedy, and Disclaimer:** Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. Please refer to the Warranty Bulletin for 3M™ Window Films (Flat Glass Applications) and 3M™ Impact Protection Attachment (IPA) Sealant for complete details on warranty coverage, which can be obtained by contacting your 3M Authorized Window Film Dealer or your local 3M sales representative. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR

ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

**Limitation of Liability:** Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

## 9. Questions

If you have any questions regarding installation, please contact your 3M technical representative or local 3M sales representative.

Note: These guidelines replace “3M Window Film Installation – Security Window Film Technical Bulletin March 2019.”

### Commercial Branding and Transportation

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